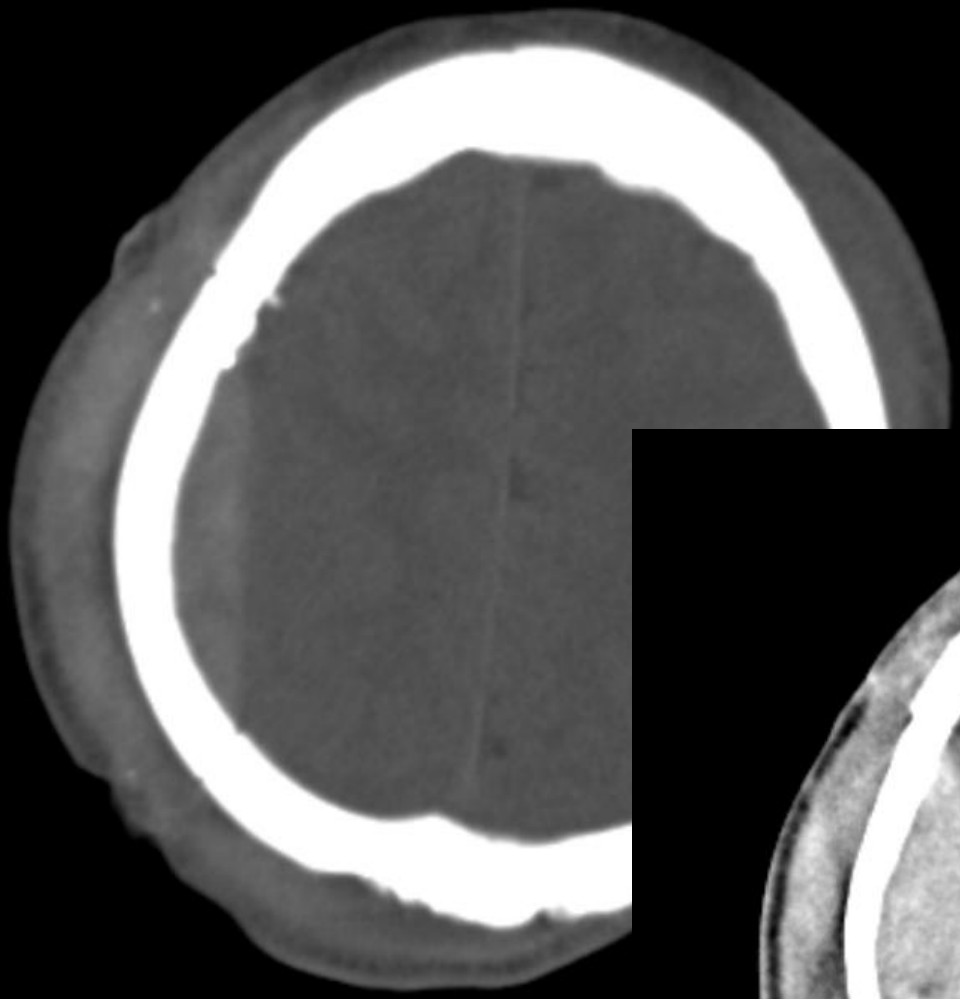
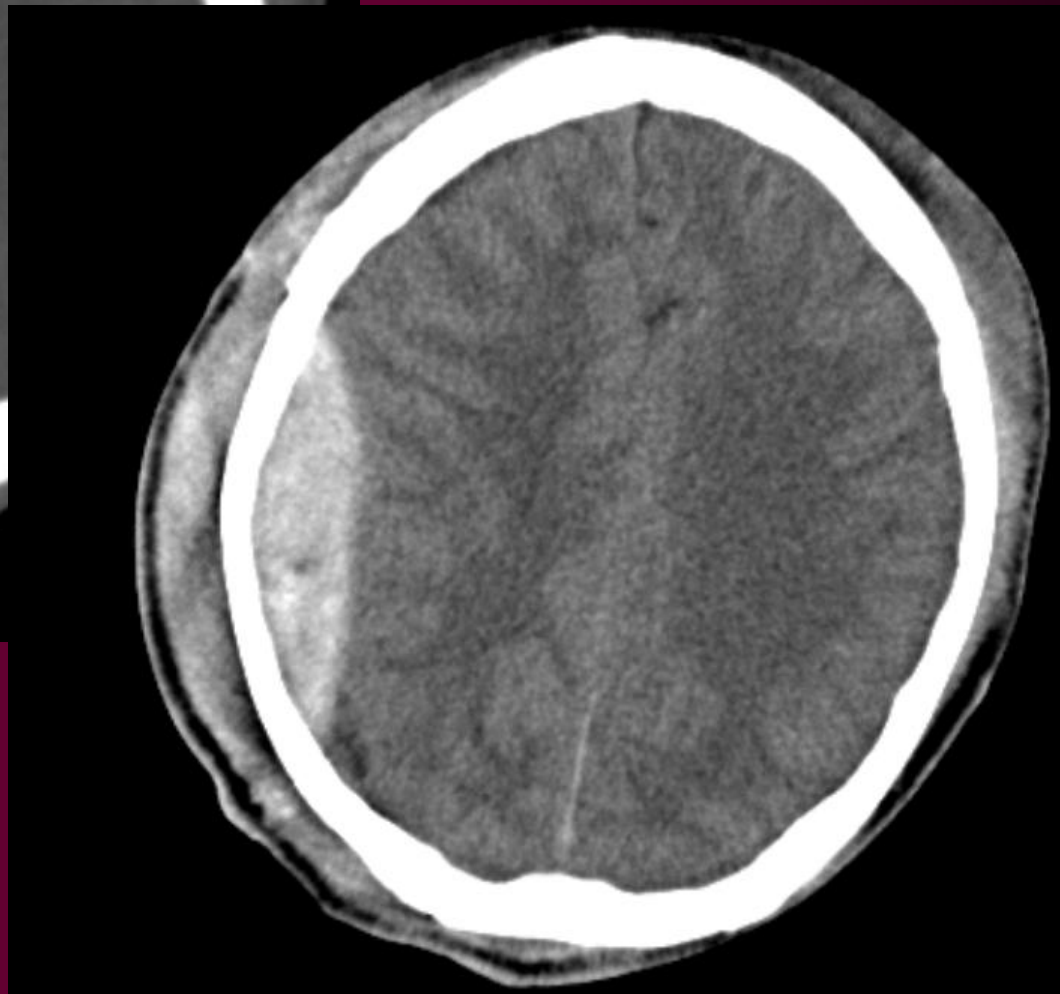
颅脑外伤影像学诊断

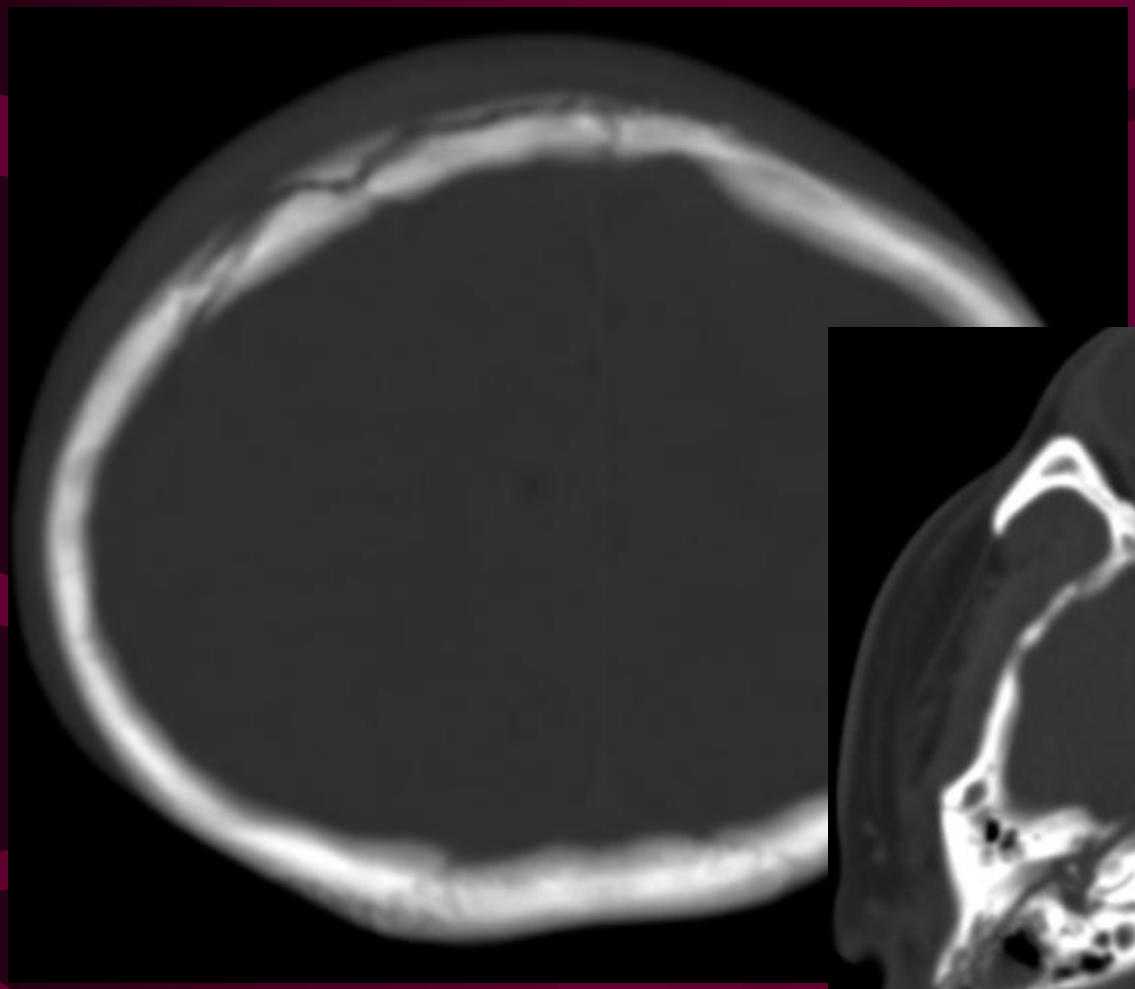
川北医学院 翟昭华

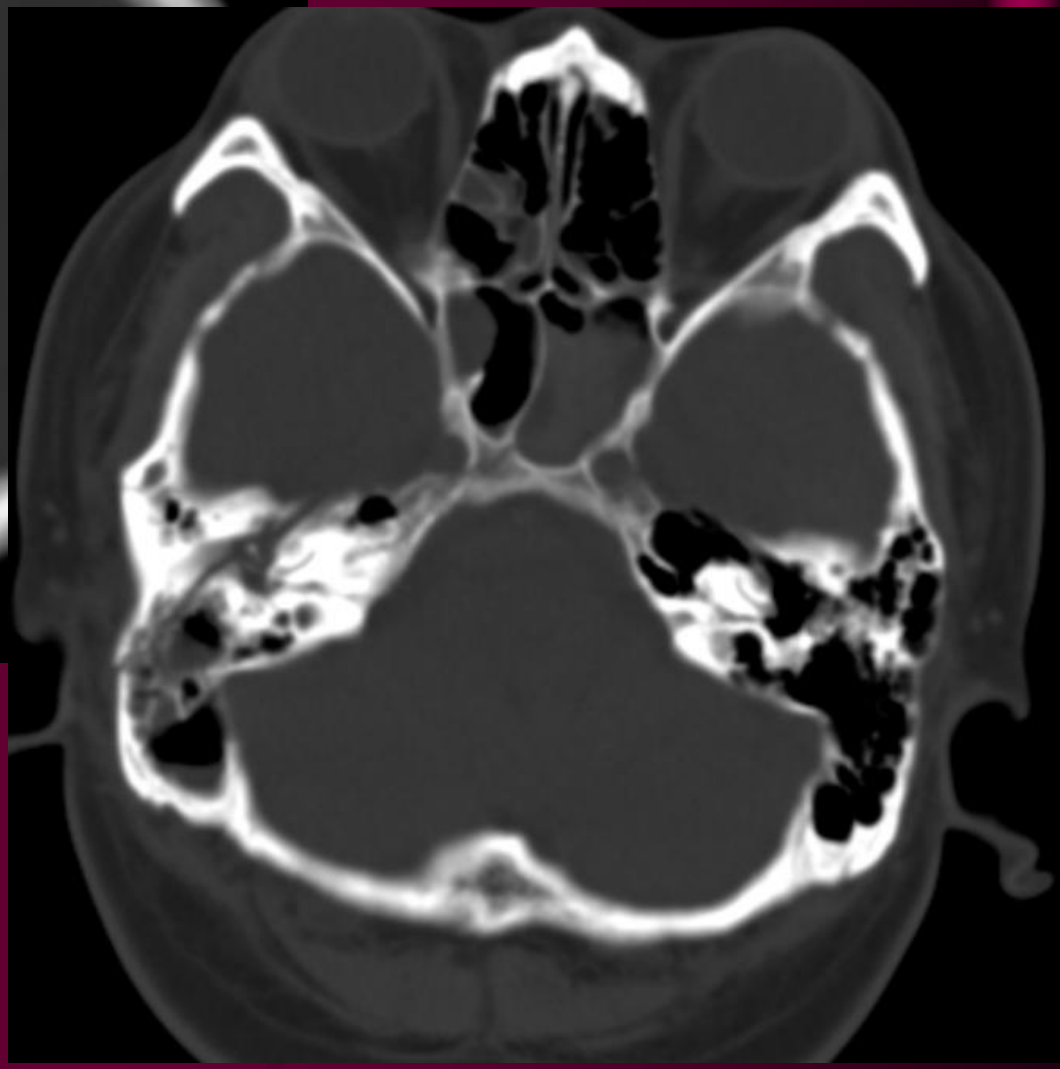
头皮血肿
颅骨骨折





硬膜外血肿软组织肿胀





骨折

硬膜外血肿

血液聚集在颅骨内板与硬膜之间。

多数硬膜外血肿是由于骨折损伤血管和硬脑膜动脉出血所致。

病　理

- 位于头颅直接损伤部位
- 颅骨骨折或局部暂时变形使脑膜血管破裂
- 脑膜中动脉及分支破裂占70－80％，多位于颞区，也见于顶枕区
- 硬膜与颅骨粘连紧密，血肿局限
- 少数原因为损伤板障静脉、静脉窦和蛛网膜颗粒
- 多数不伴脑实质损伤

硬膜外血肿－CT表现

1、常位于颅骨骨折部位，特别是骨折通过脑膜中动脉或静脉窦的区域

2、颅骨内板下方梭形高密度影，边界锐利 CT值40－100HU

血肿范围一般不越过颅缝，如骨折跨越骨缝，血肿可跨颅缝

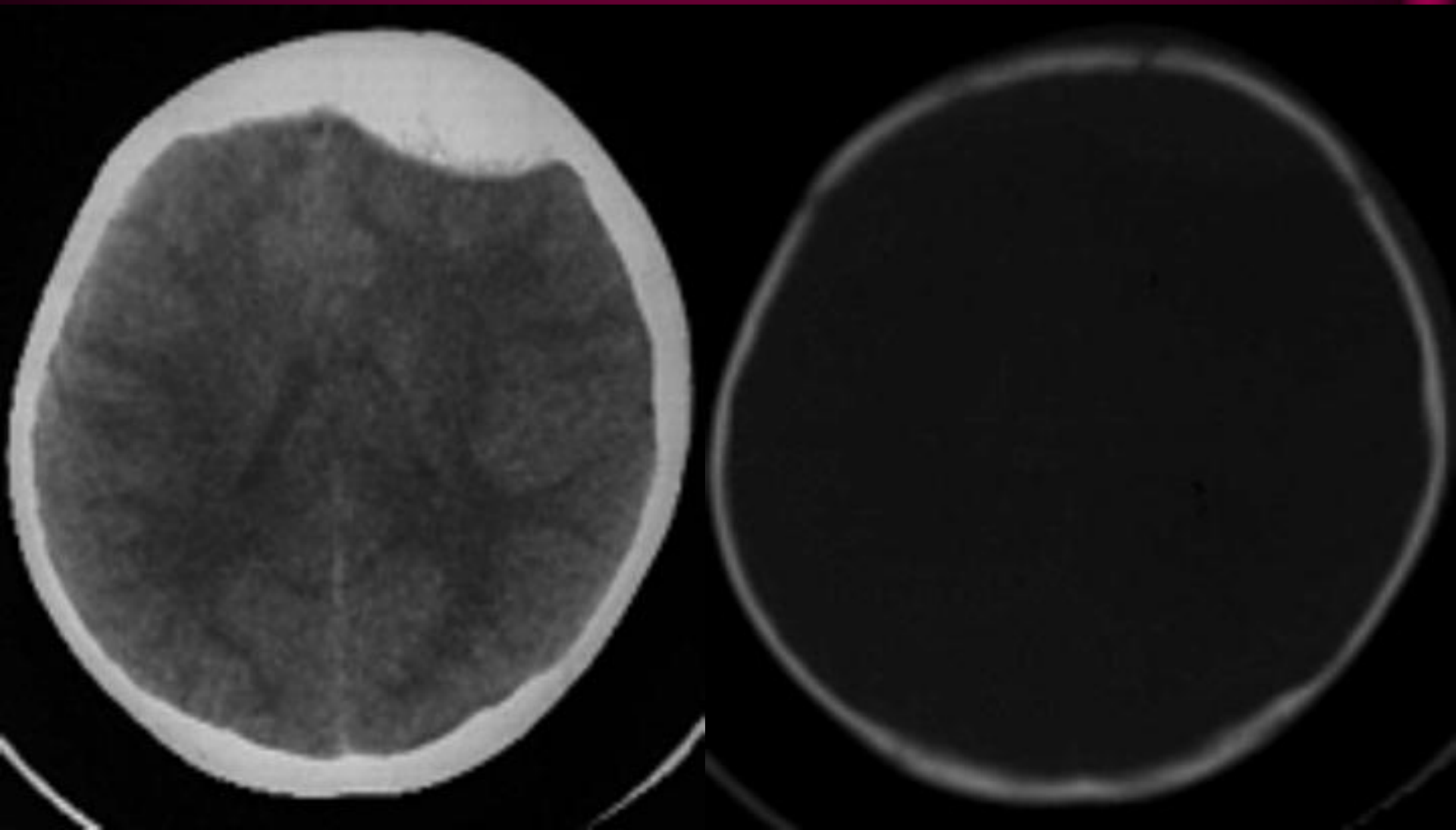
硬膜外血肿—CT表现

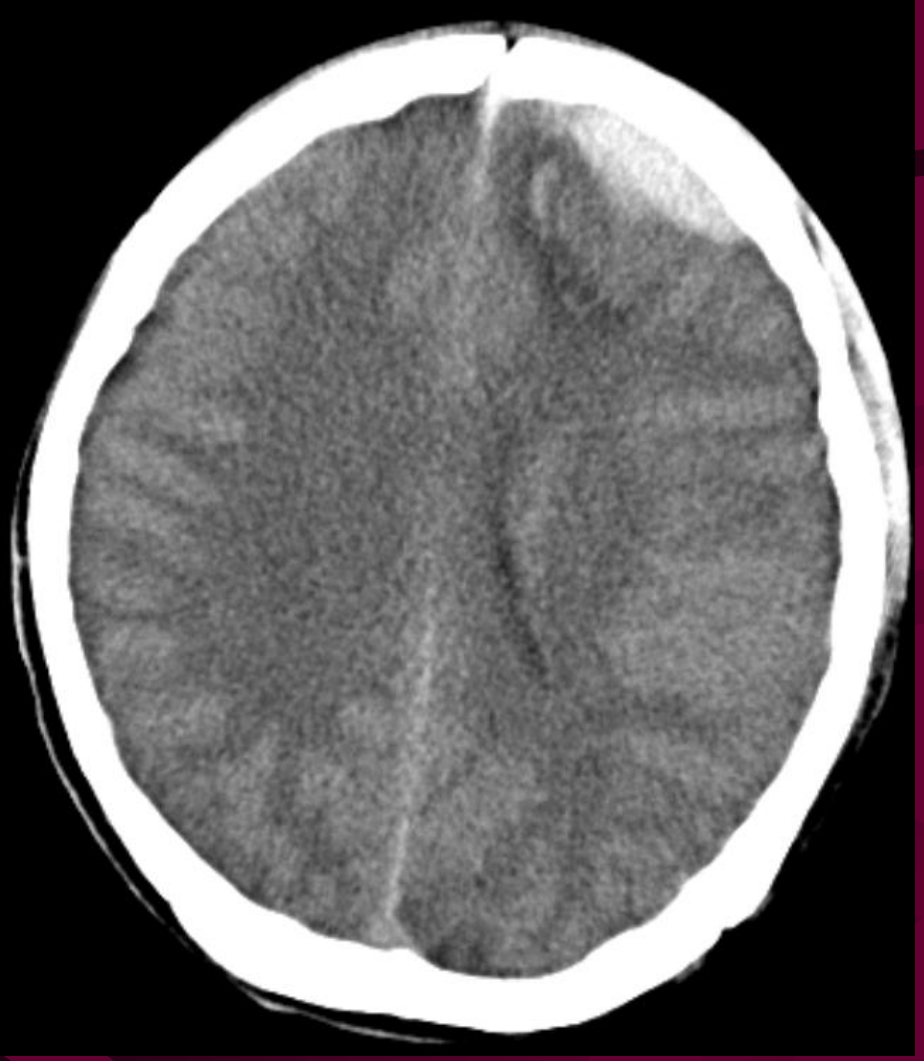
3、占位效应较轻

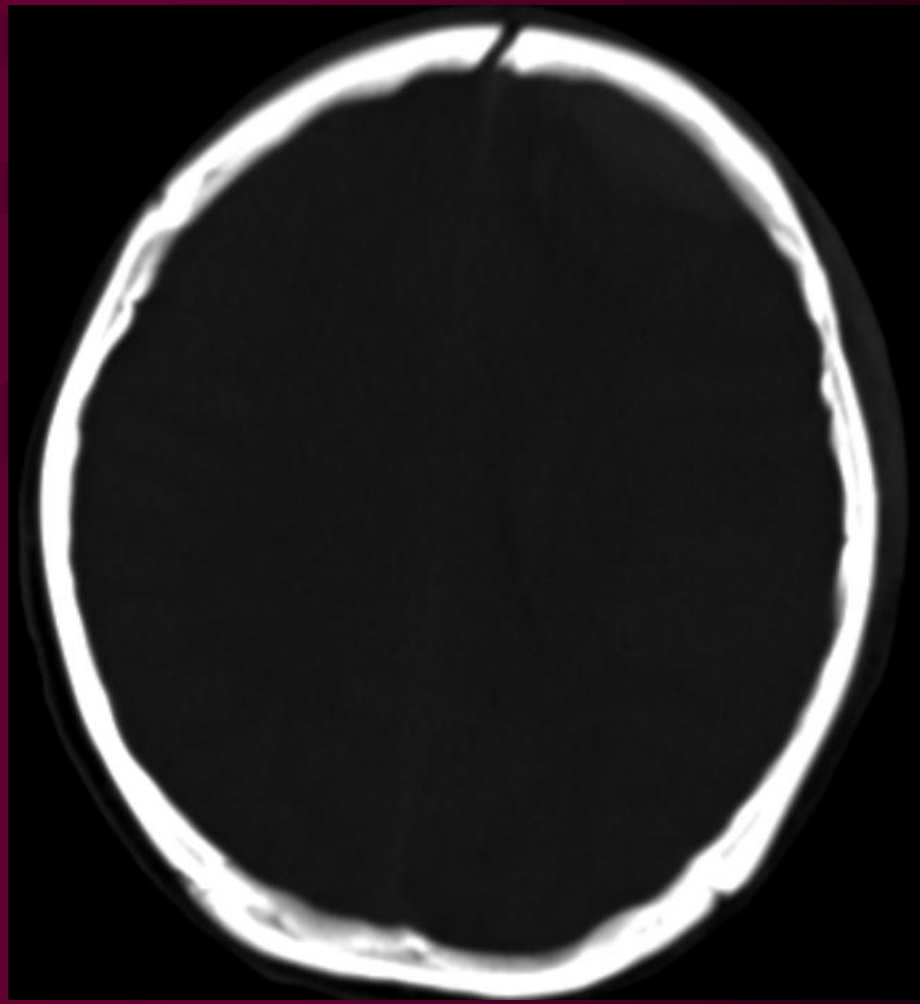
4、慢性血肿需增强扫描

5、上矢状窦、枕窦和横窦损伤的硬膜外血肿，需冠状面扫描

硬膜外血肿－CT表现







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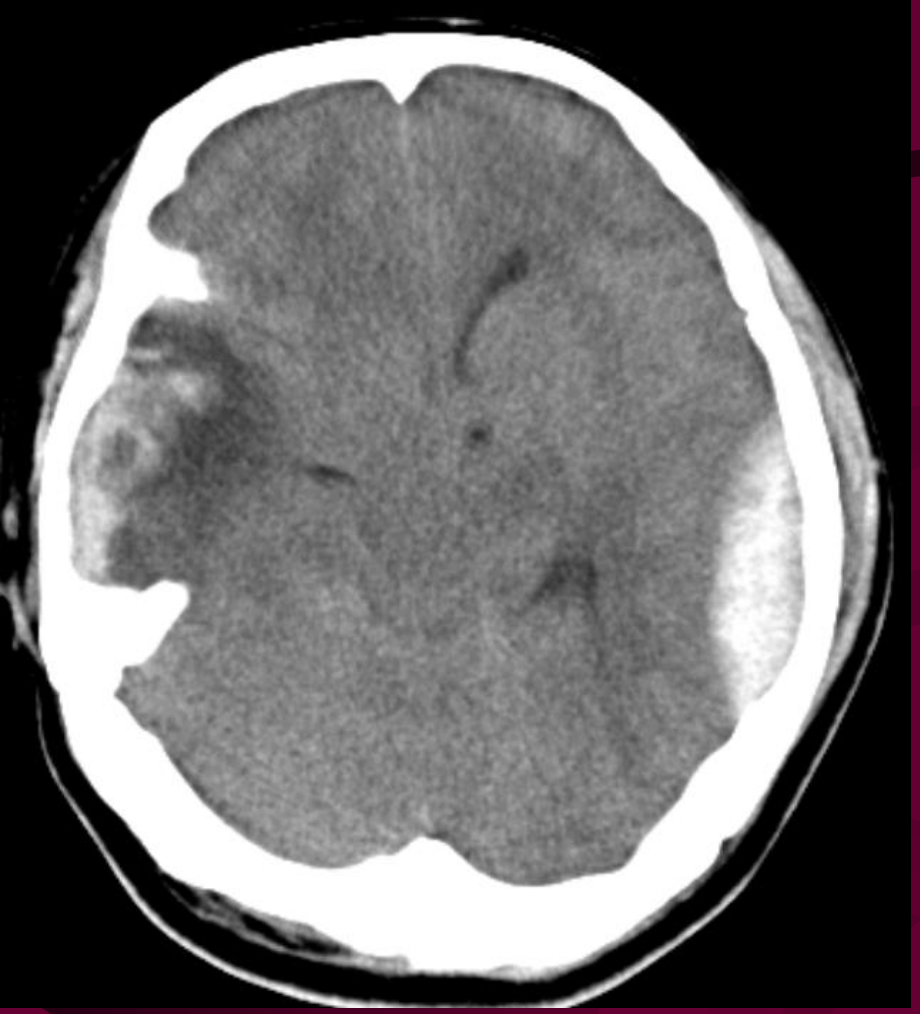
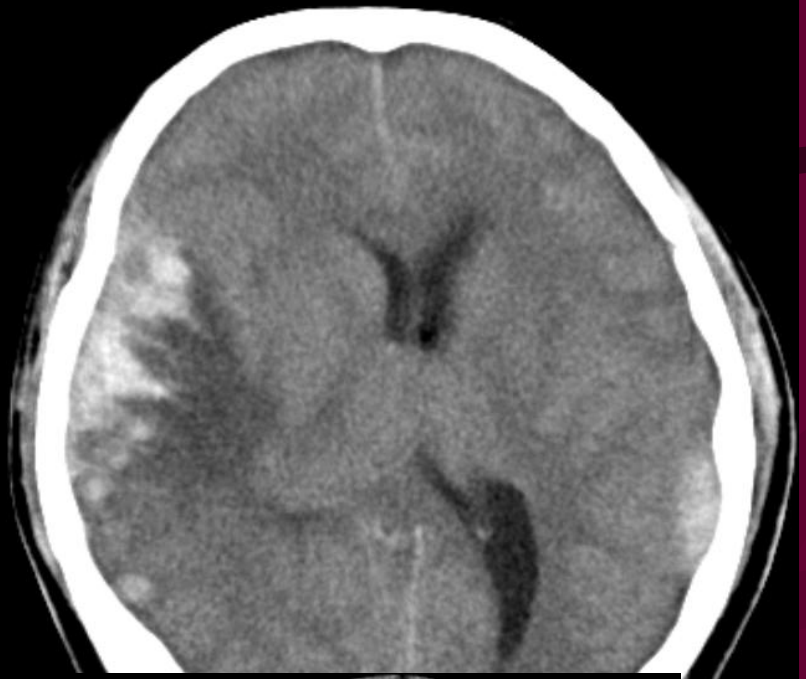
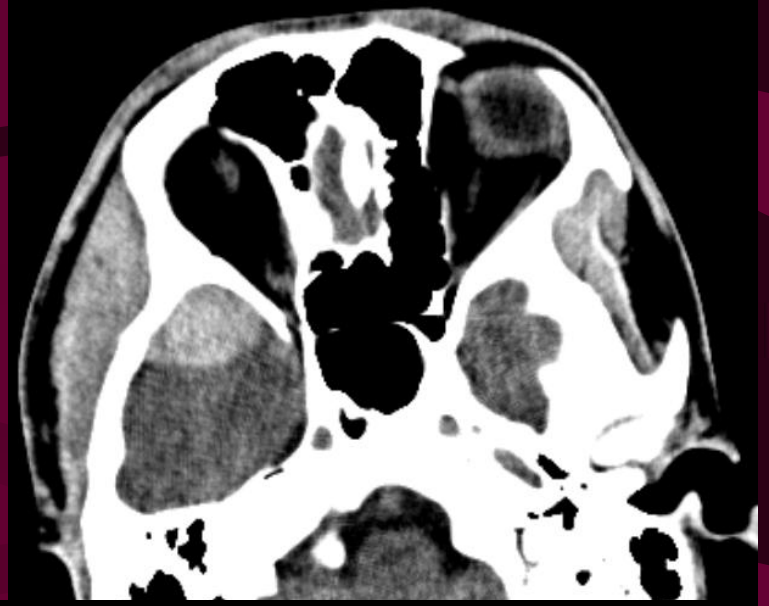
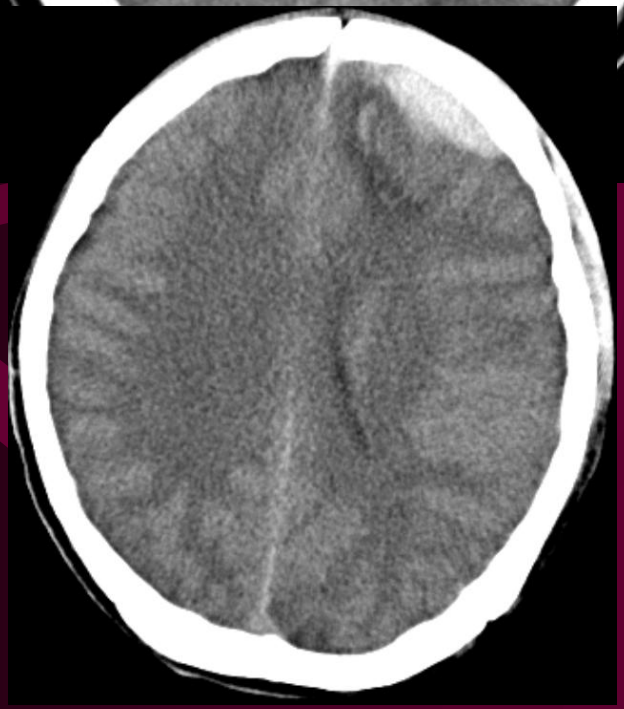
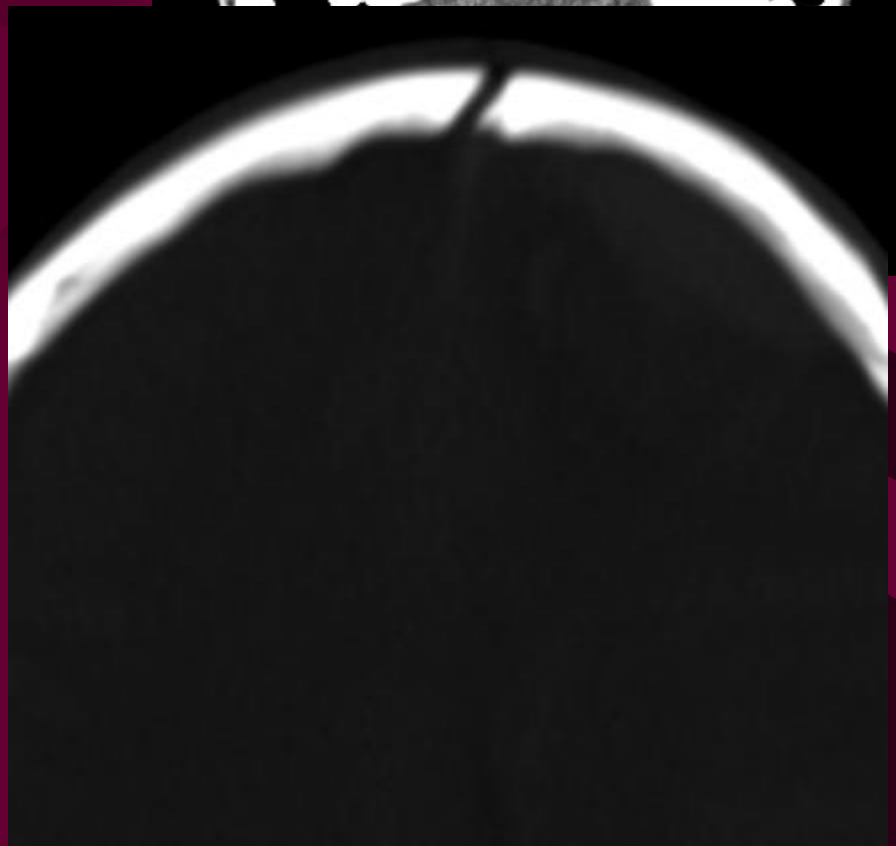


硬膜外血肿









硬膜外血肿—MRI表现

梭形，边界锐利

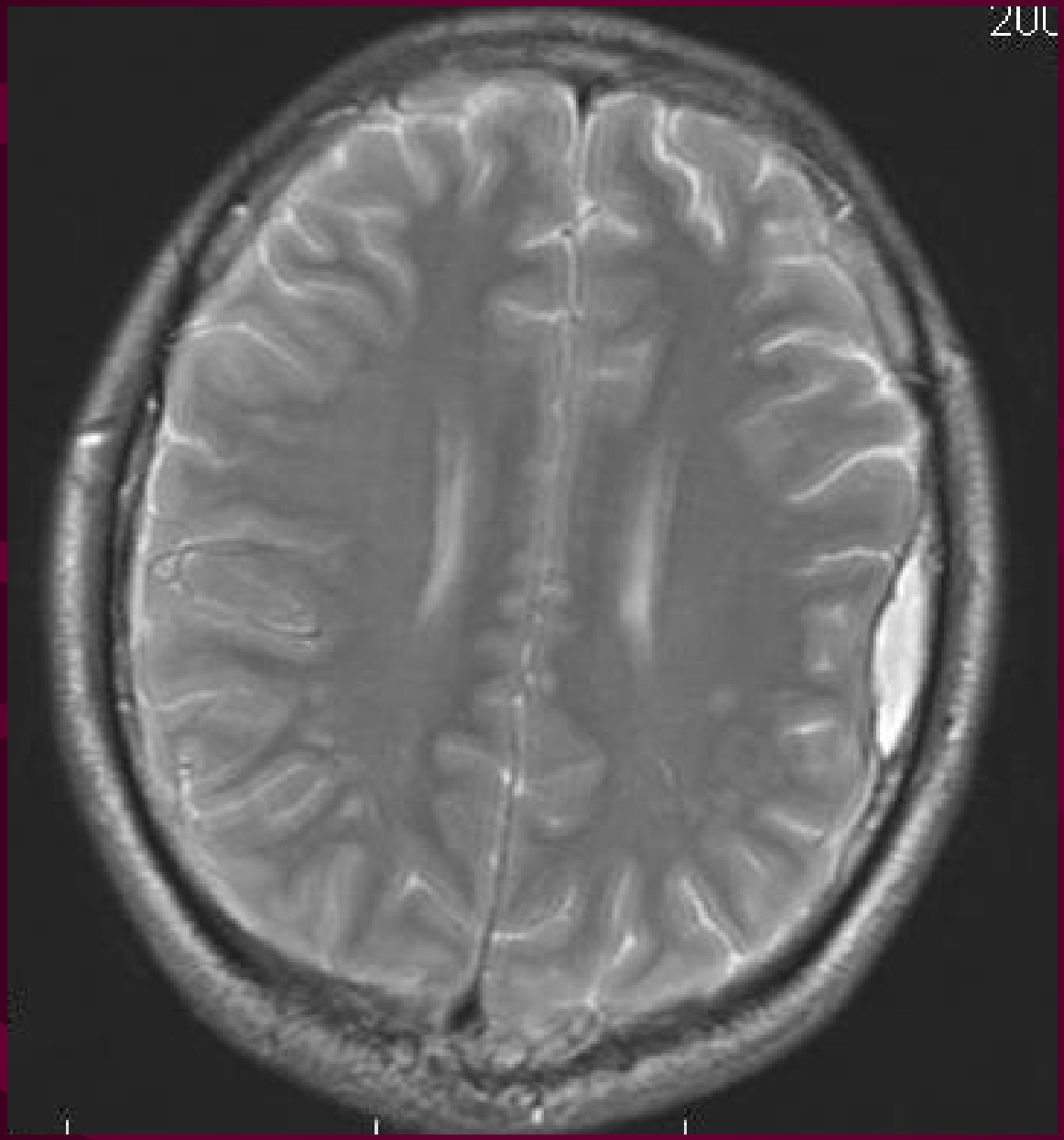
急性期：

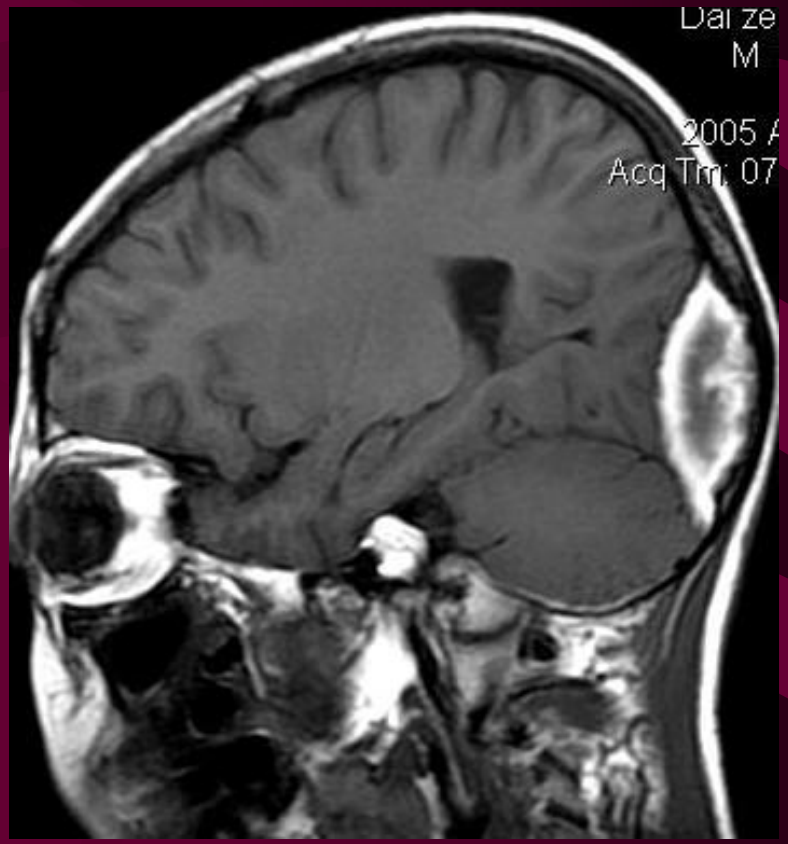
T1W等信号；

T2W低信号。

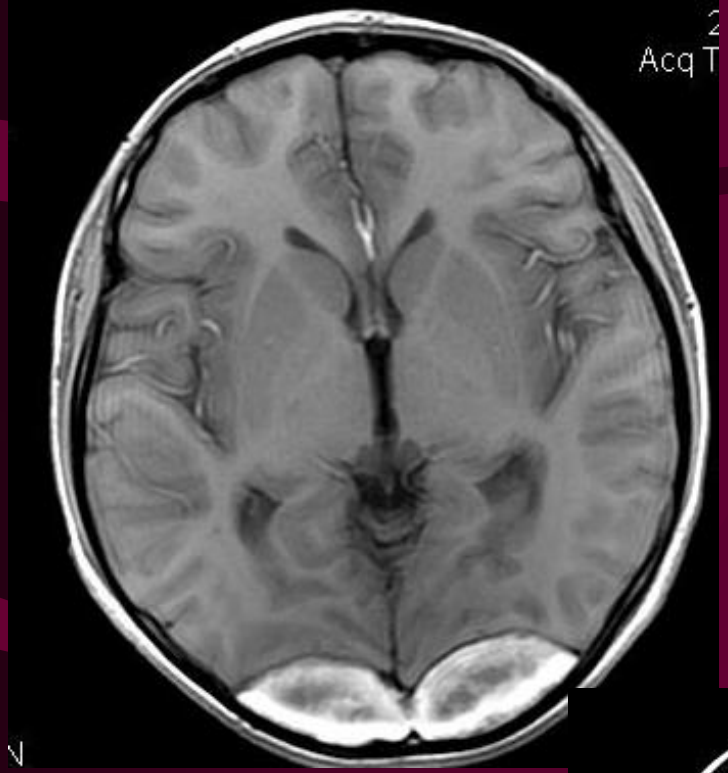
亚急性和慢性期：

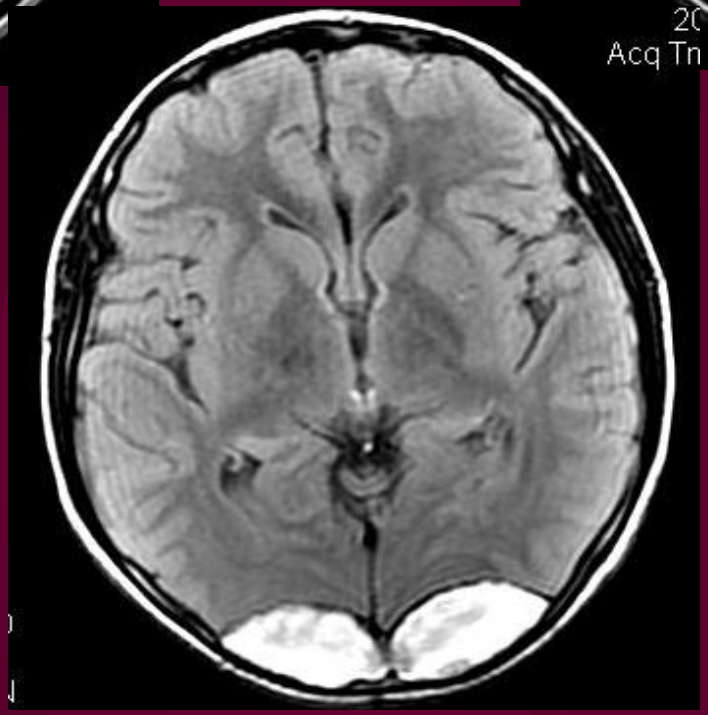
T1W和T2W均为高信号。





双枕叶硬膜外血肿





双枕叶硬膜外血肿

硬膜下血肿

血液聚集在硬脑膜与蛛网膜之间

多因头颅在运动中受伤

对冲性硬膜下血肿更有意义

根据血肿形成时间和临床表现分为三型

- 急性硬膜下血肿：伤后3天内，皮质撕裂或挫伤引起皮质的动脉或静脉破裂。范围广，新月型。
- 亚急性：伤后4～14天。新月型或半月型。
- 慢性：14天以后。桥静脉撕裂，血液缓慢溢入硬膜下腔。血肿常较大。

硬膜下血肿—CT表现

1、密度、形状

急性：新月型，高密度

亚急性：新月型或过度型，高或等密度

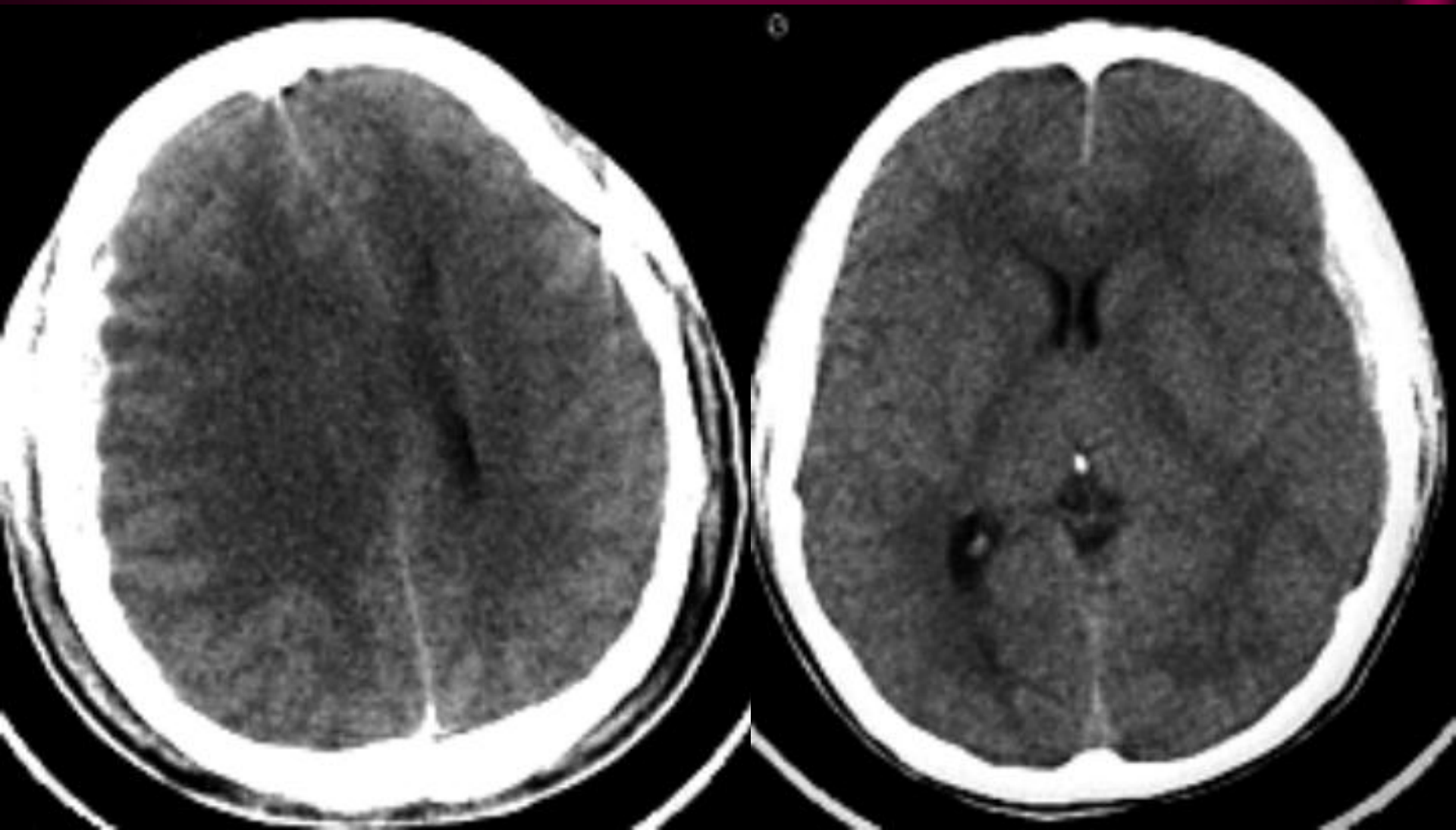
慢性：过度型，高低混合密度等密度或低密度

硬膜下血肿—CT表现

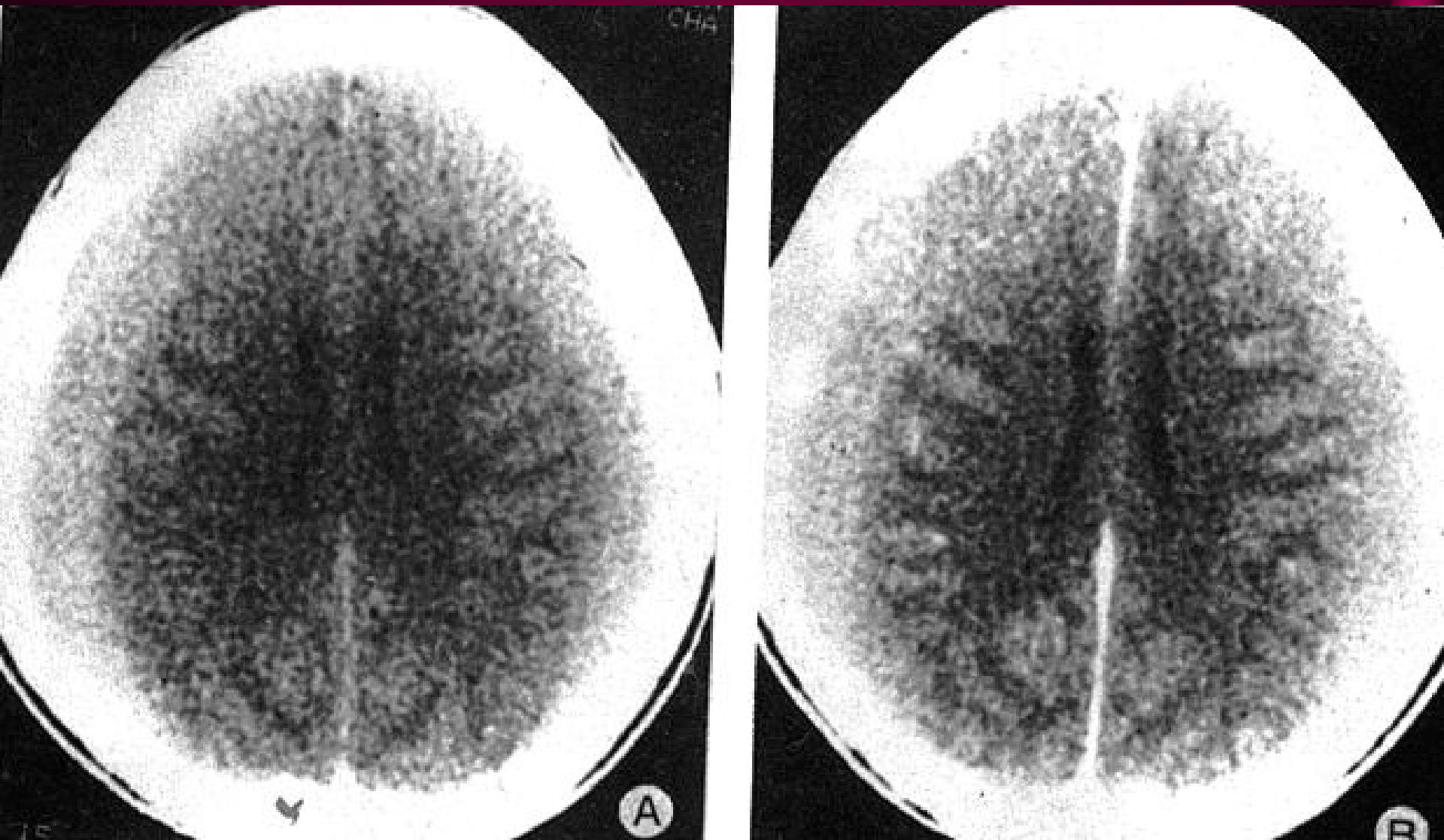
2、范围广，可跨越颅缝线，甚至覆盖整个大脑半球

3、占位征象明显

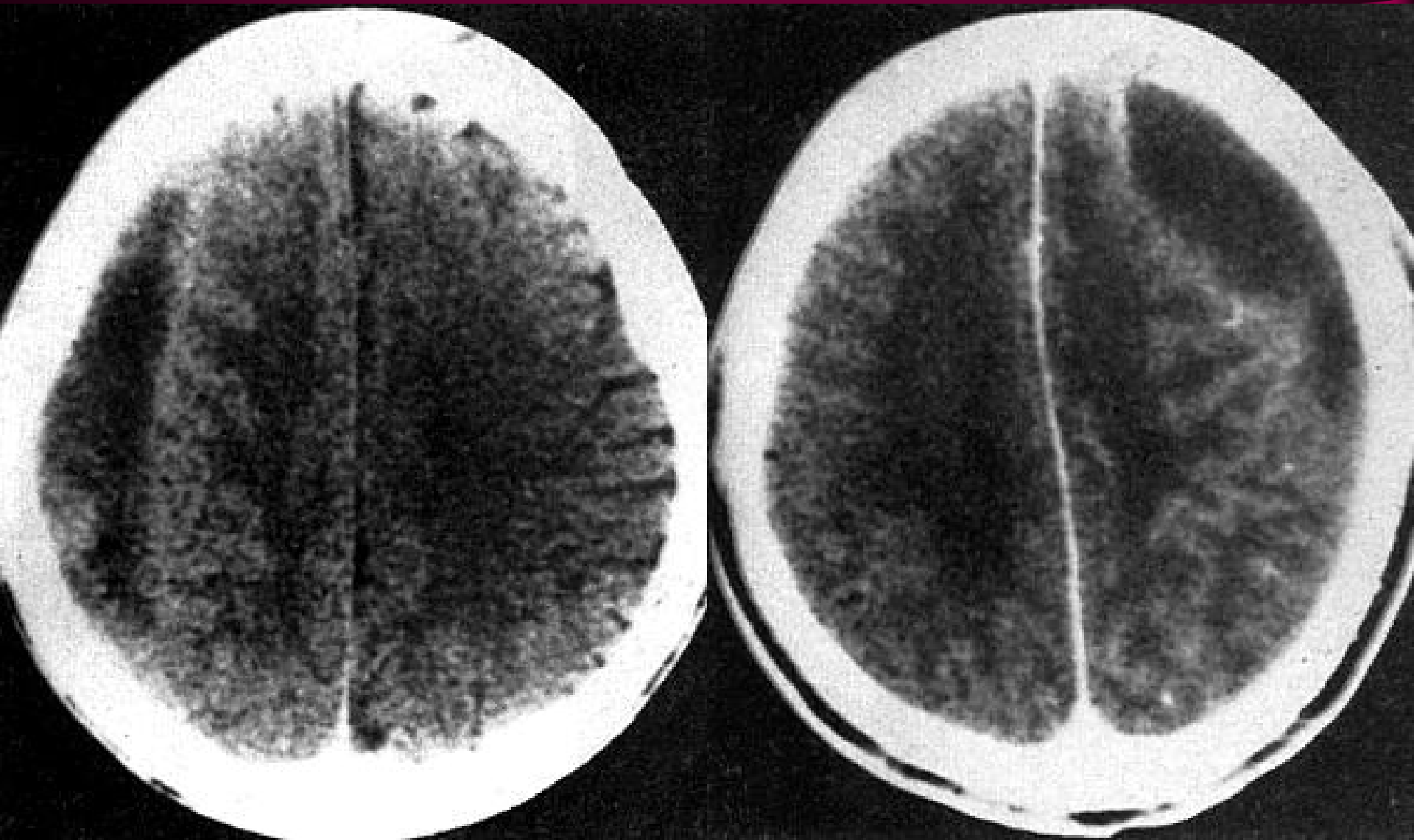
CT表现－急性硬膜下血肿

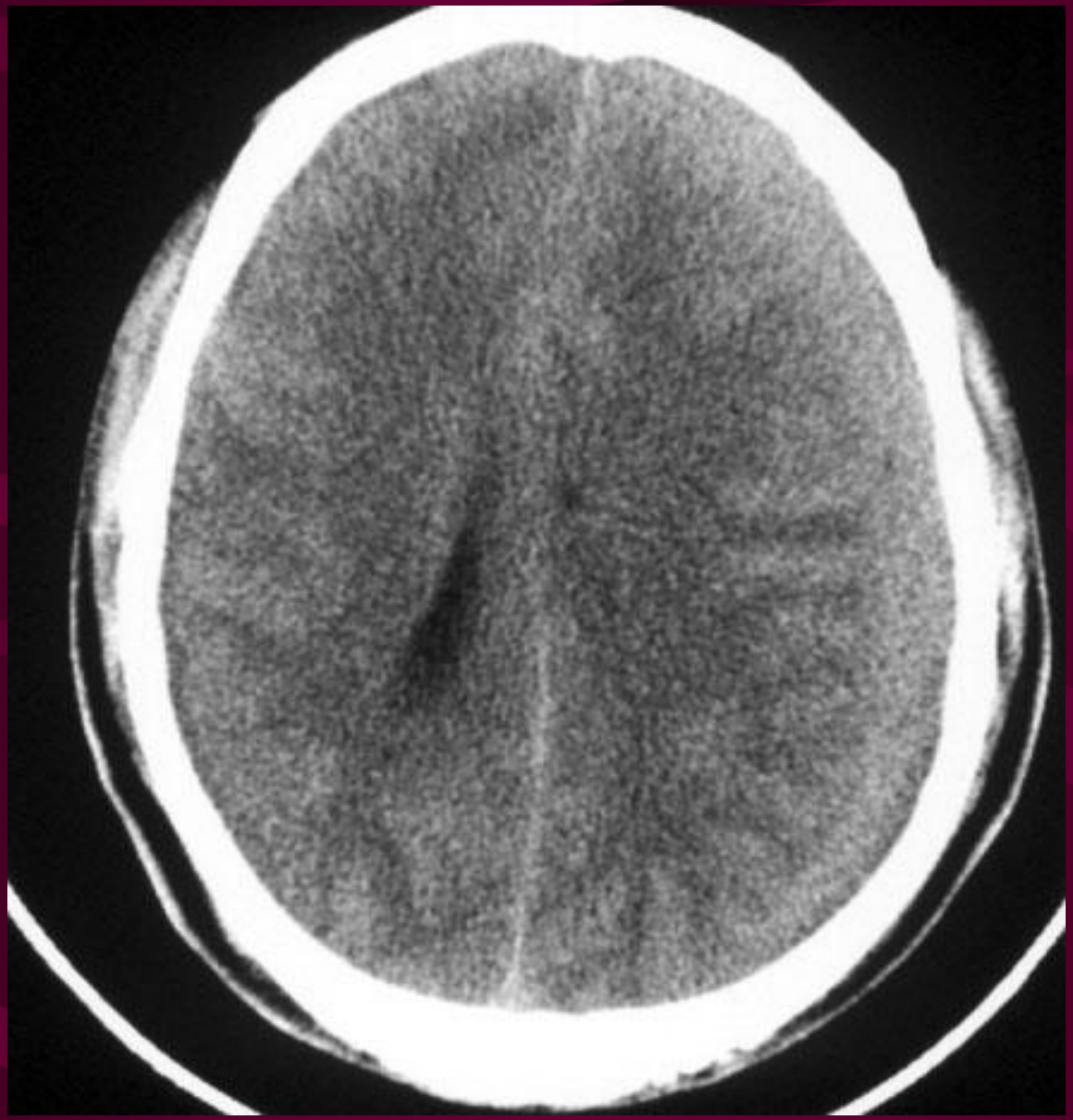


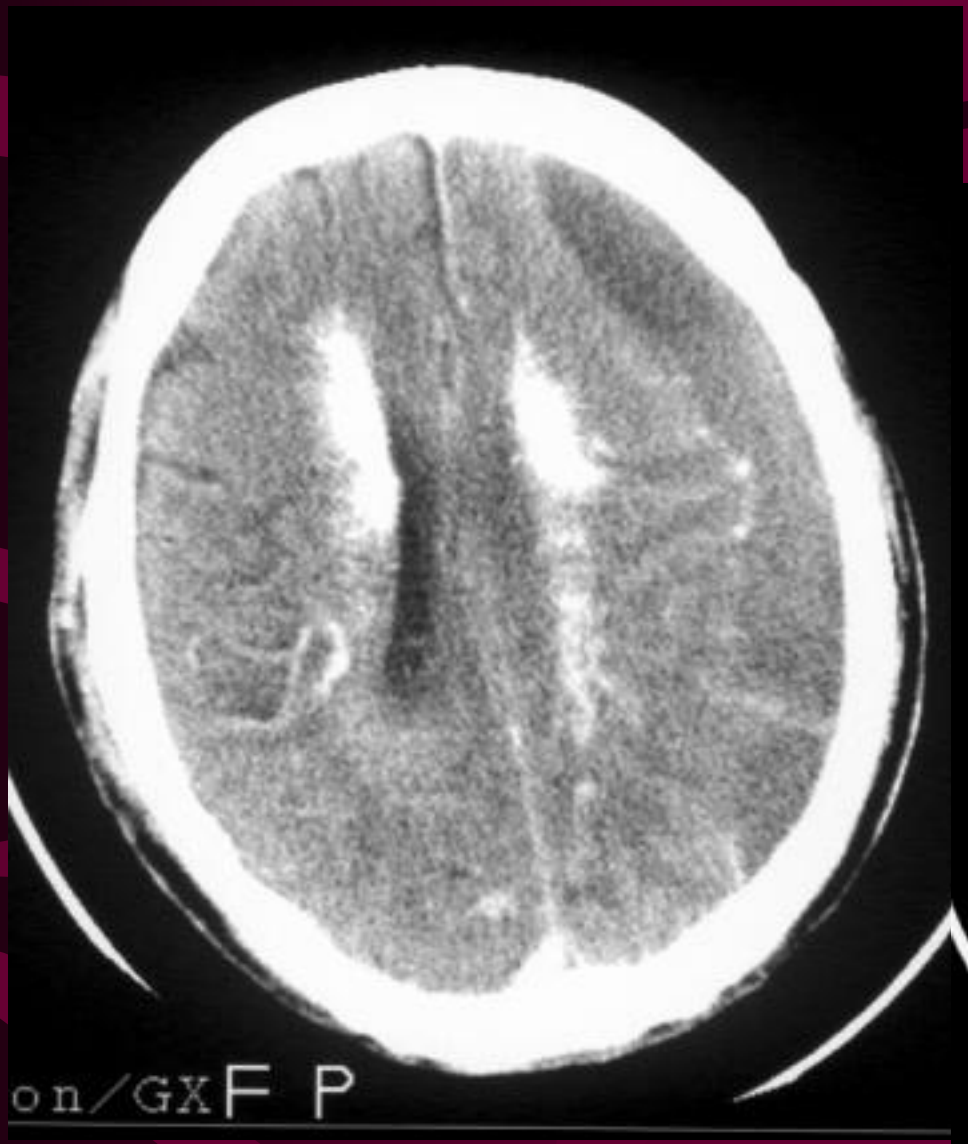
CT表现－亚急性硬膜下血肿



CT表现－慢性硬膜下血肿



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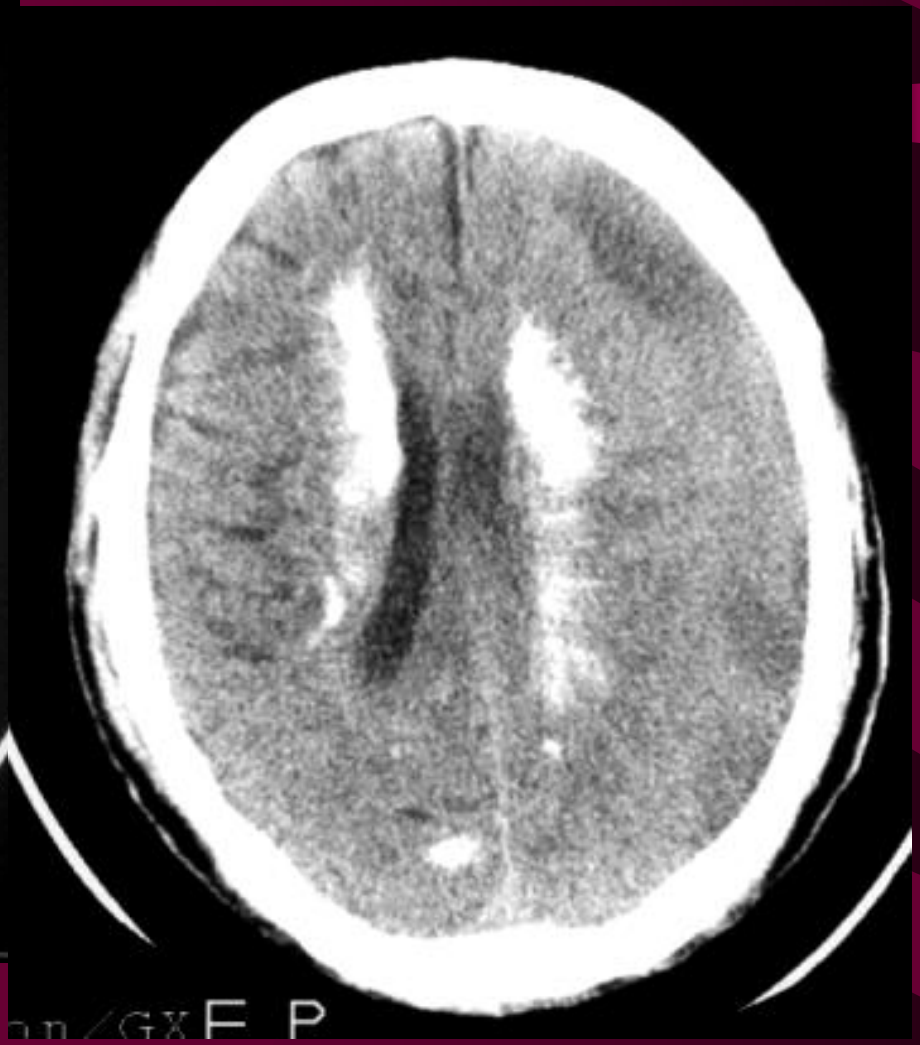
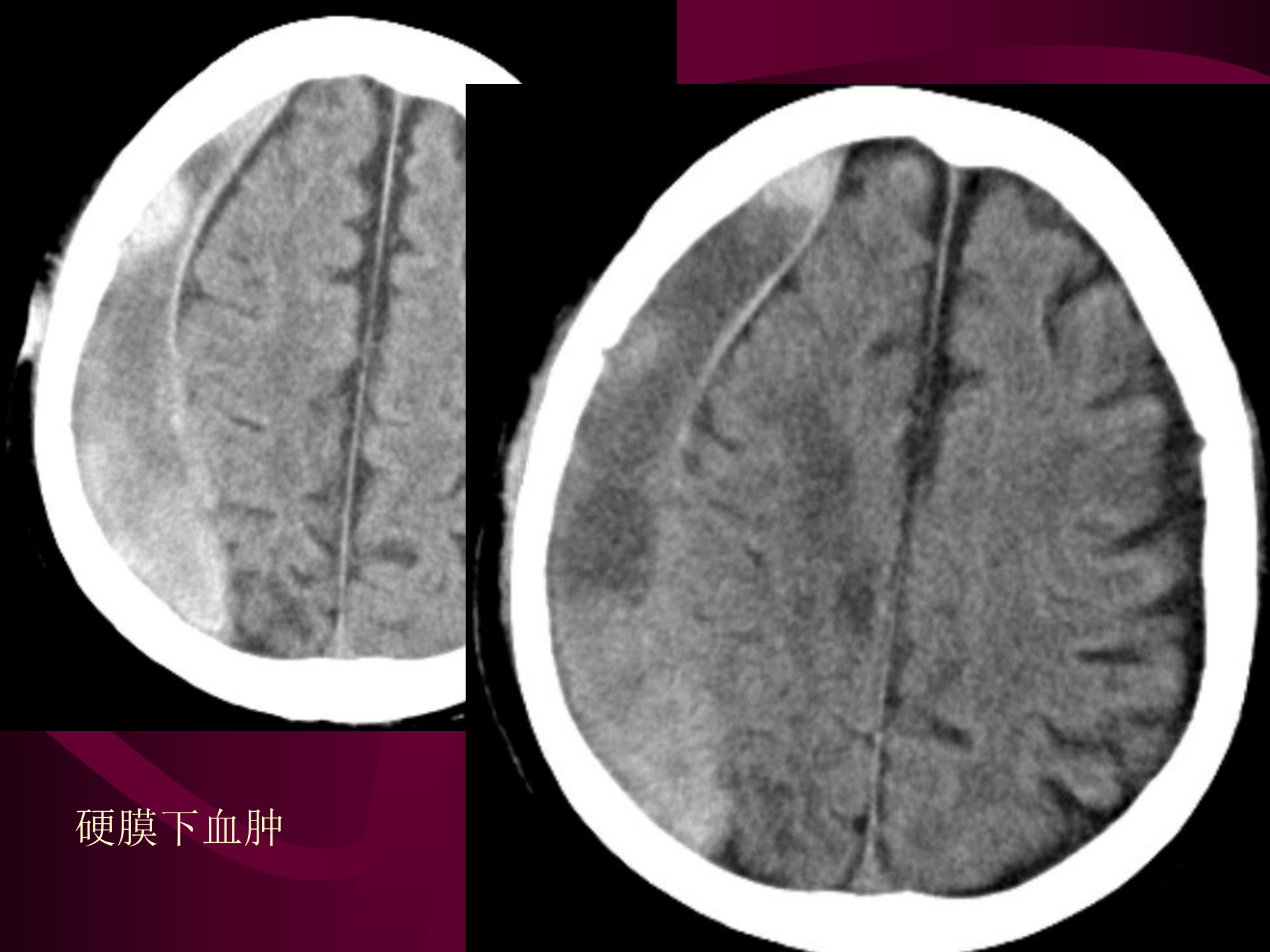




硬膜下血肿

硬膜下血肿

MRI表现－急性硬膜下血肿

去氧血红蛋白使T2缩短

T1W为等信号

T2W为低信号

MRI表现－亚急性硬膜下血肿

高铁血红蛋白和溶血使T1缩短，T2延长

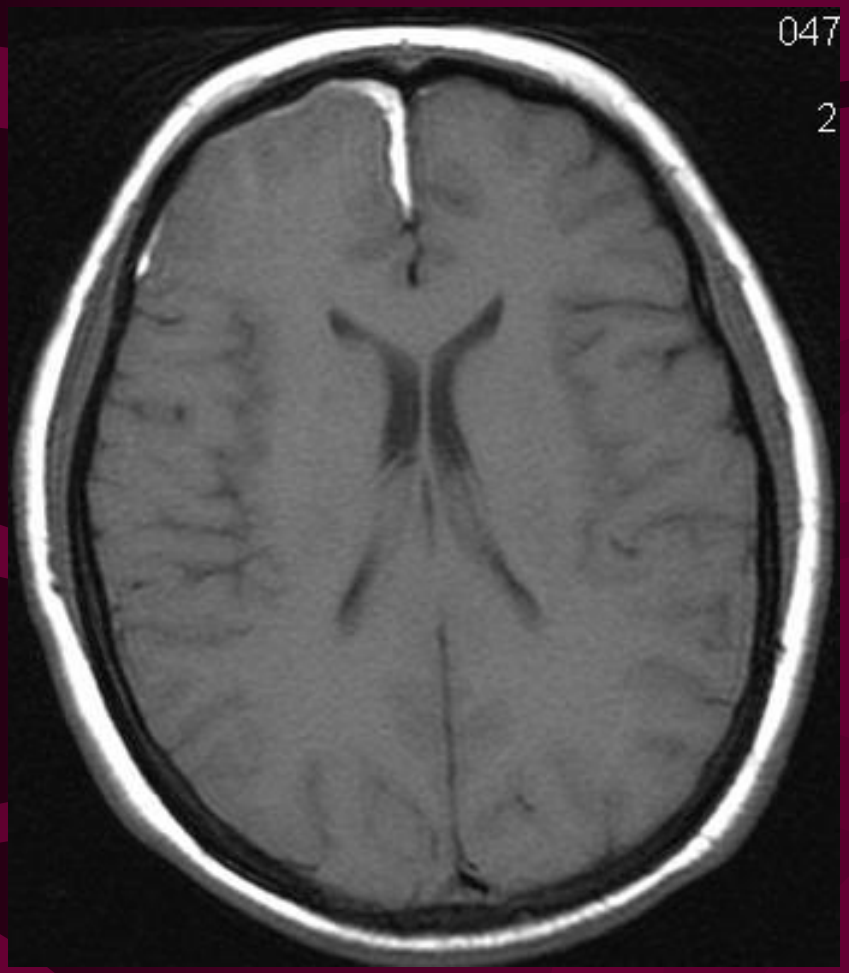
T1W和T2W均为高信号

MRI表现—慢性硬膜下血肿

高铁血红蛋白变成血红素。

T1W低信号；

T2W高信号。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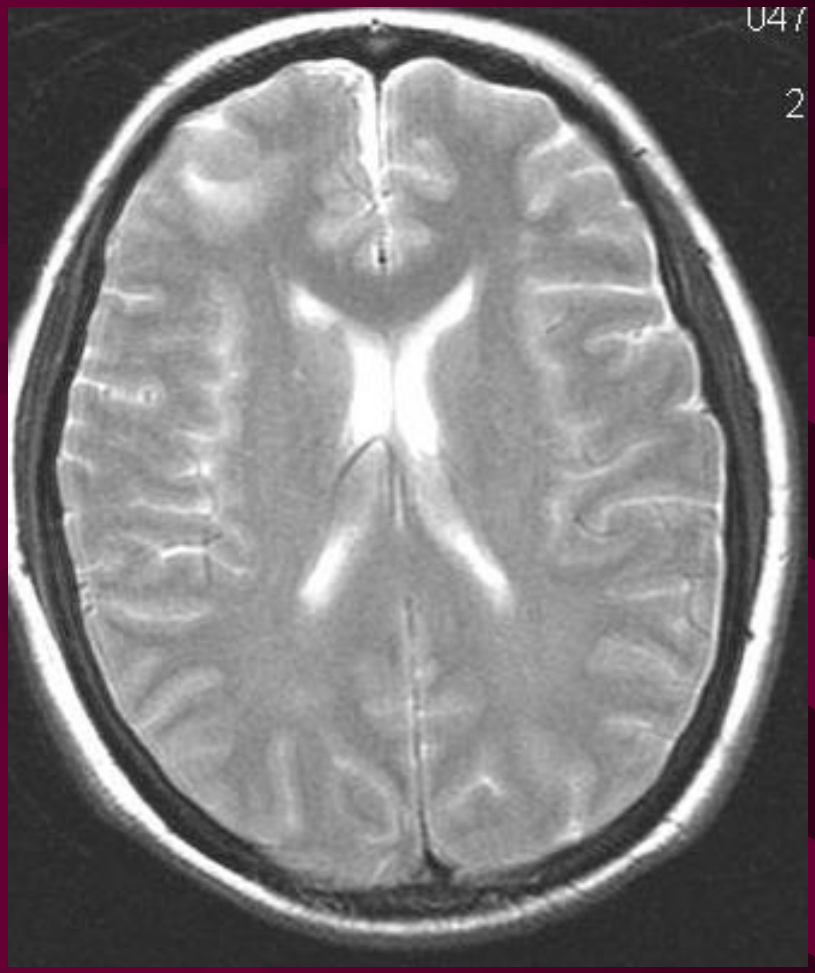
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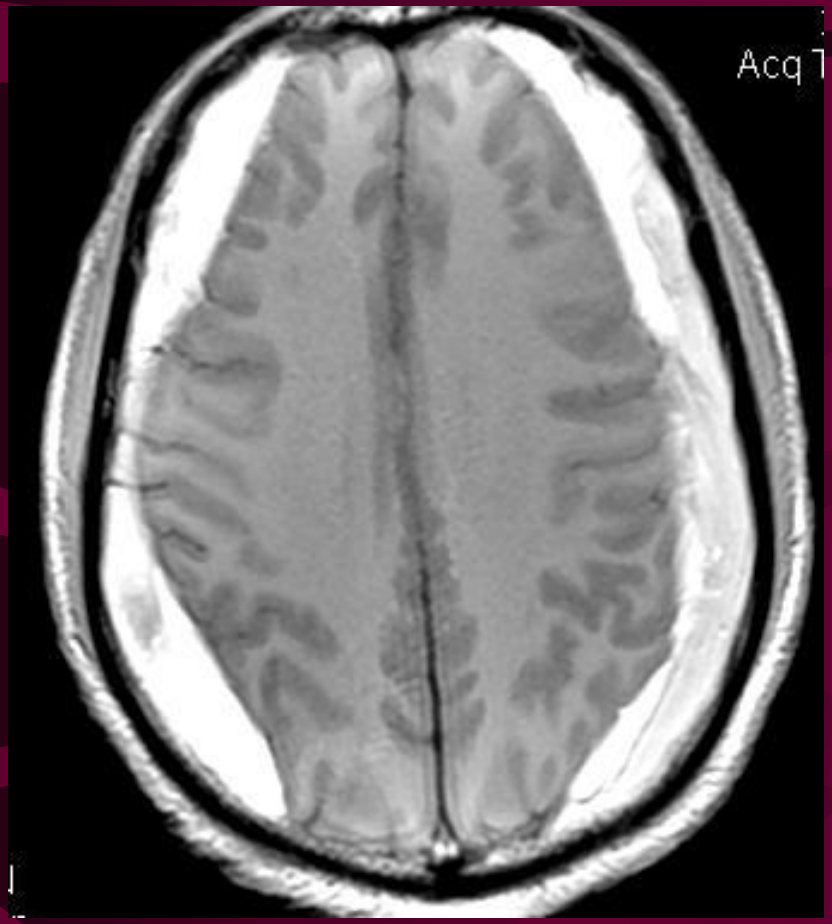

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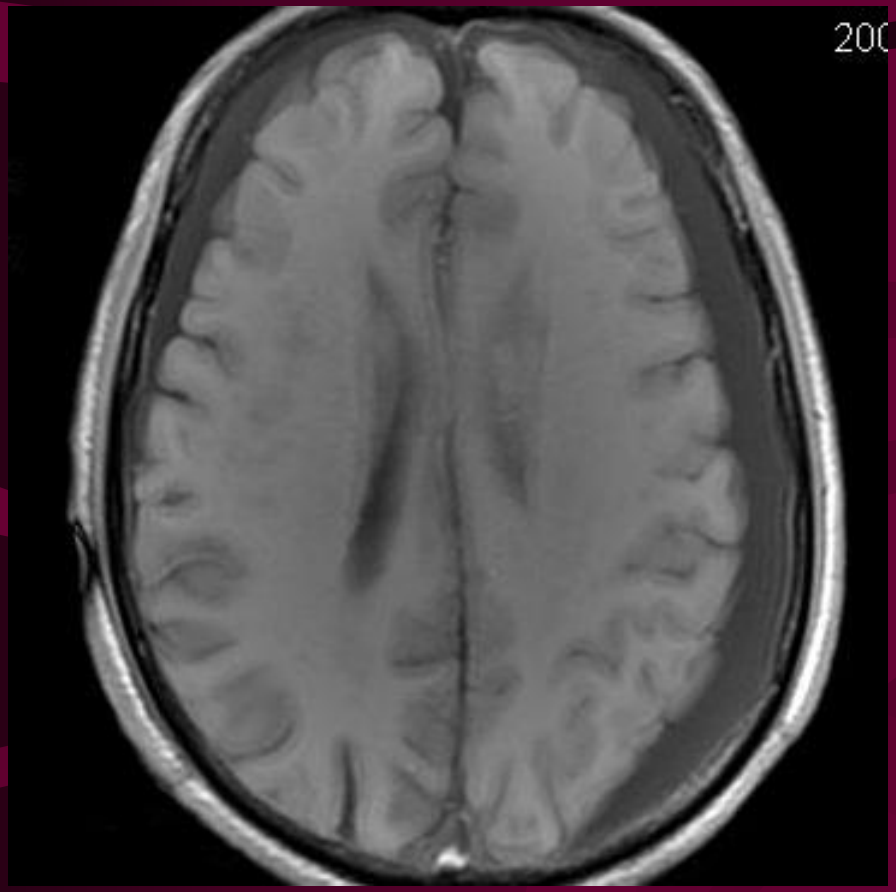
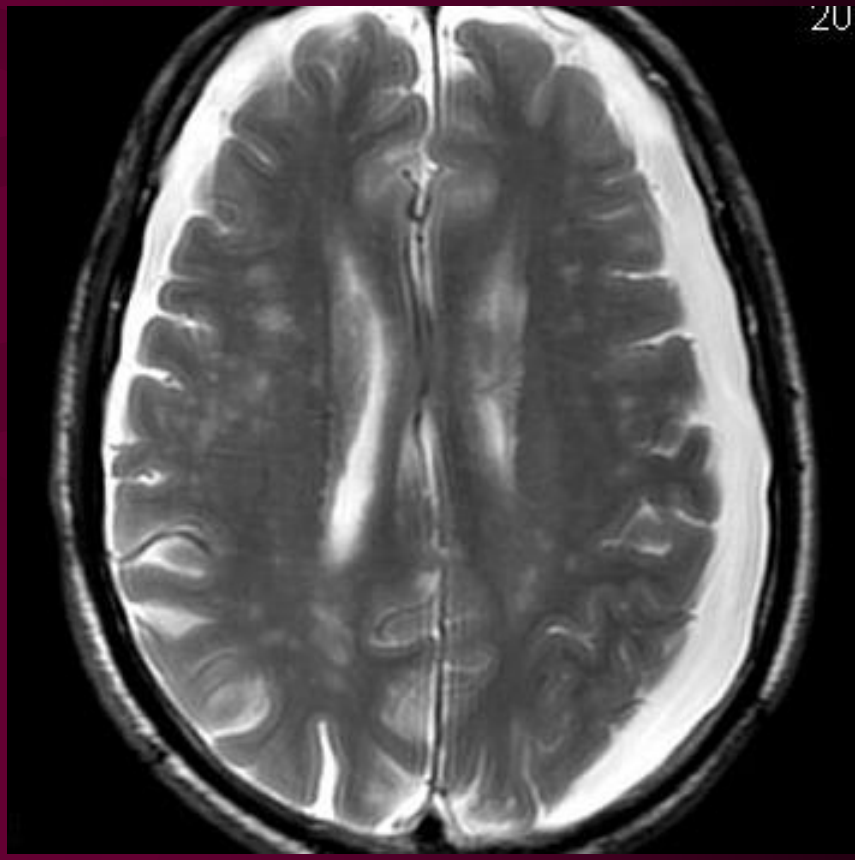




硬膜下血肿吸收

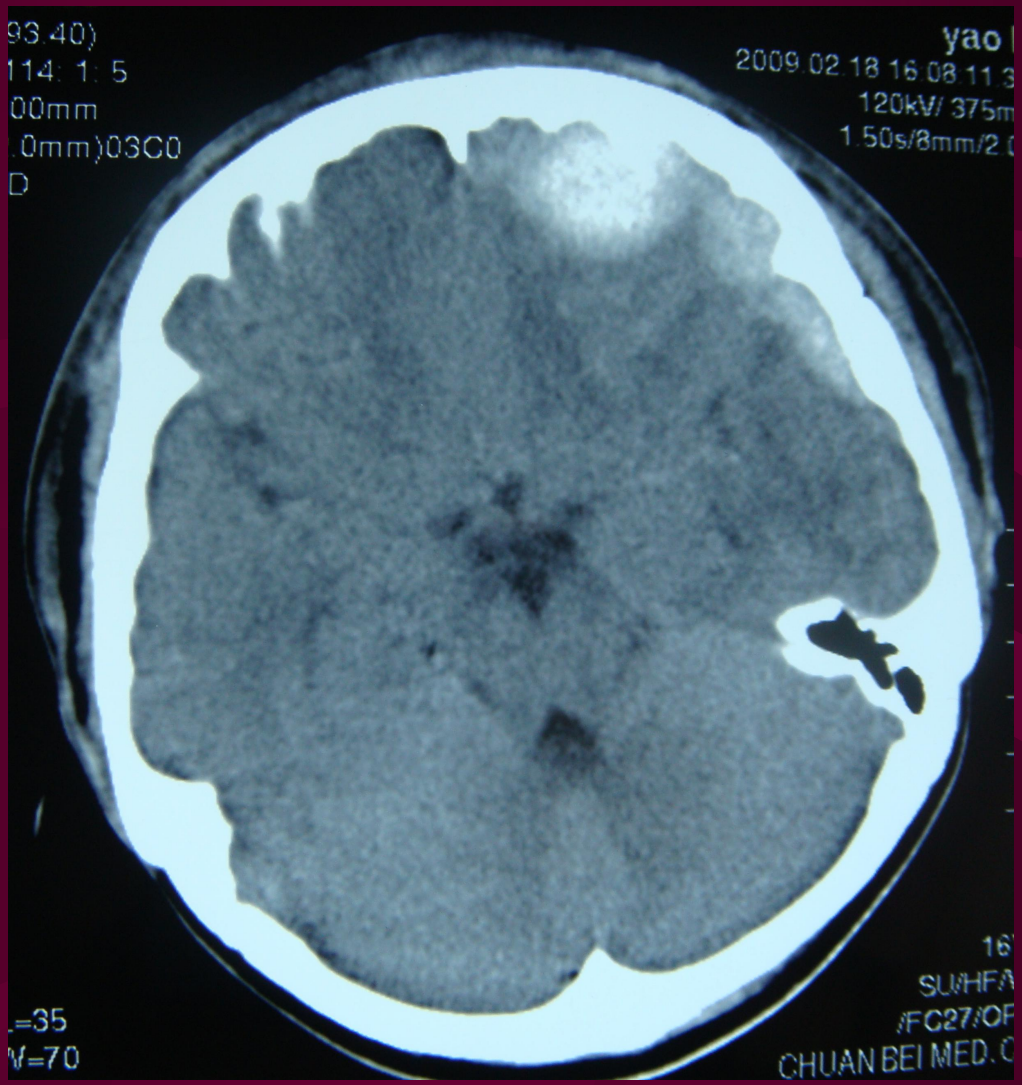

TIANDESK

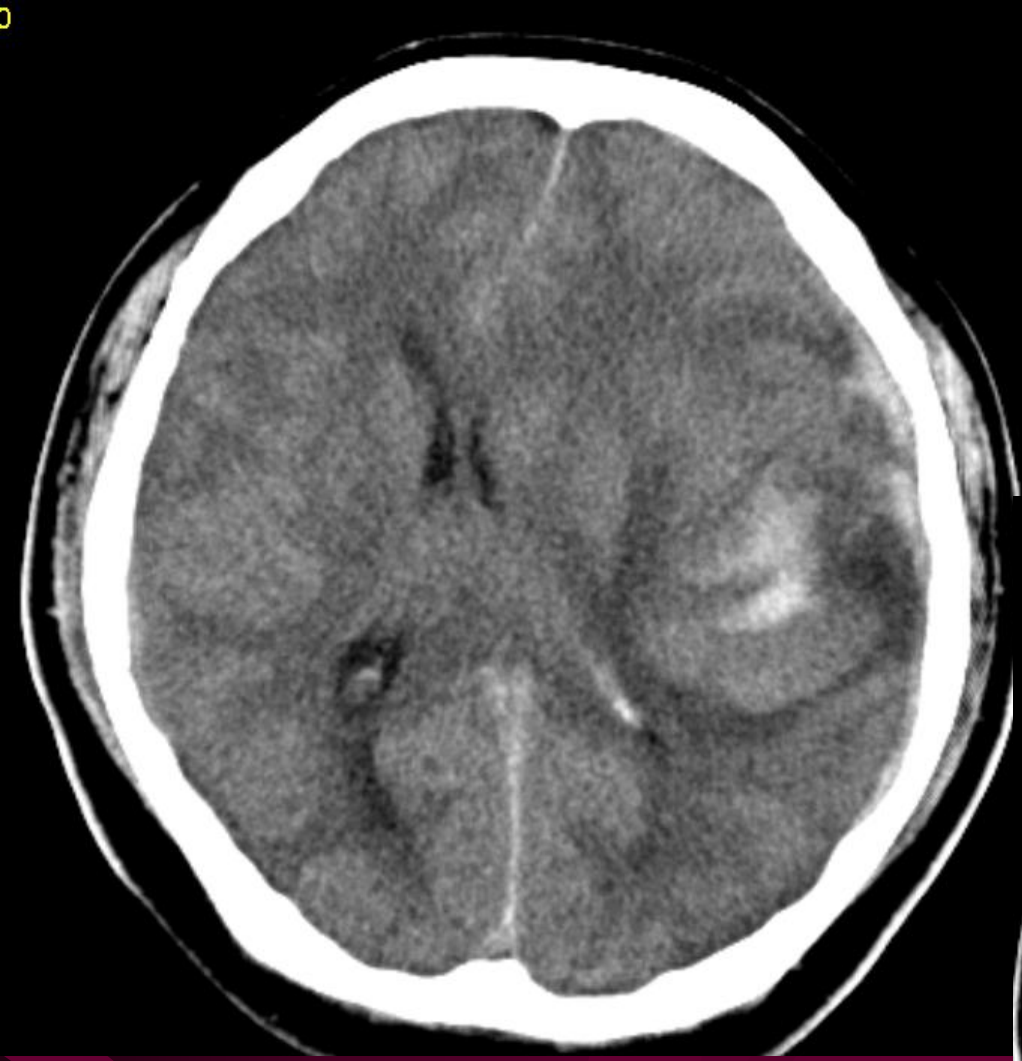
脑内血肿

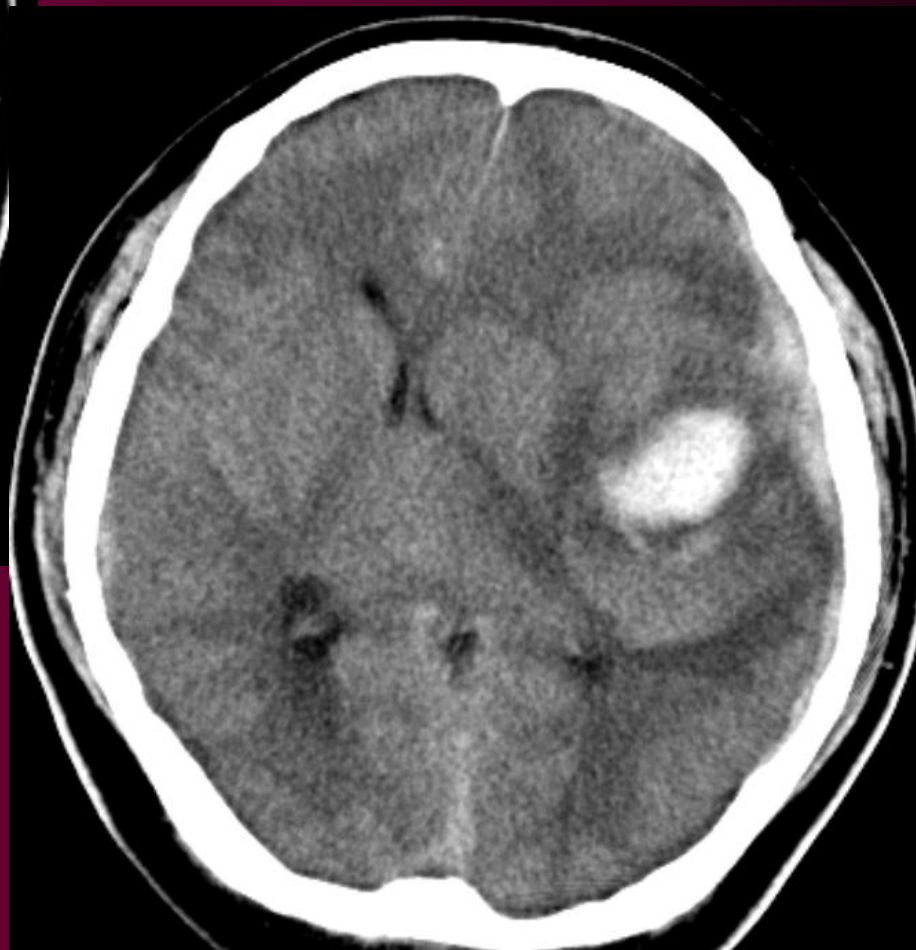
脑实质内出血形成血肿
受力或对冲部位均可
常伴发脑挫裂伤
伤后CT即可显示
9%表现晚

脑内血肿－CT表现

高密度，CT值50～90HU





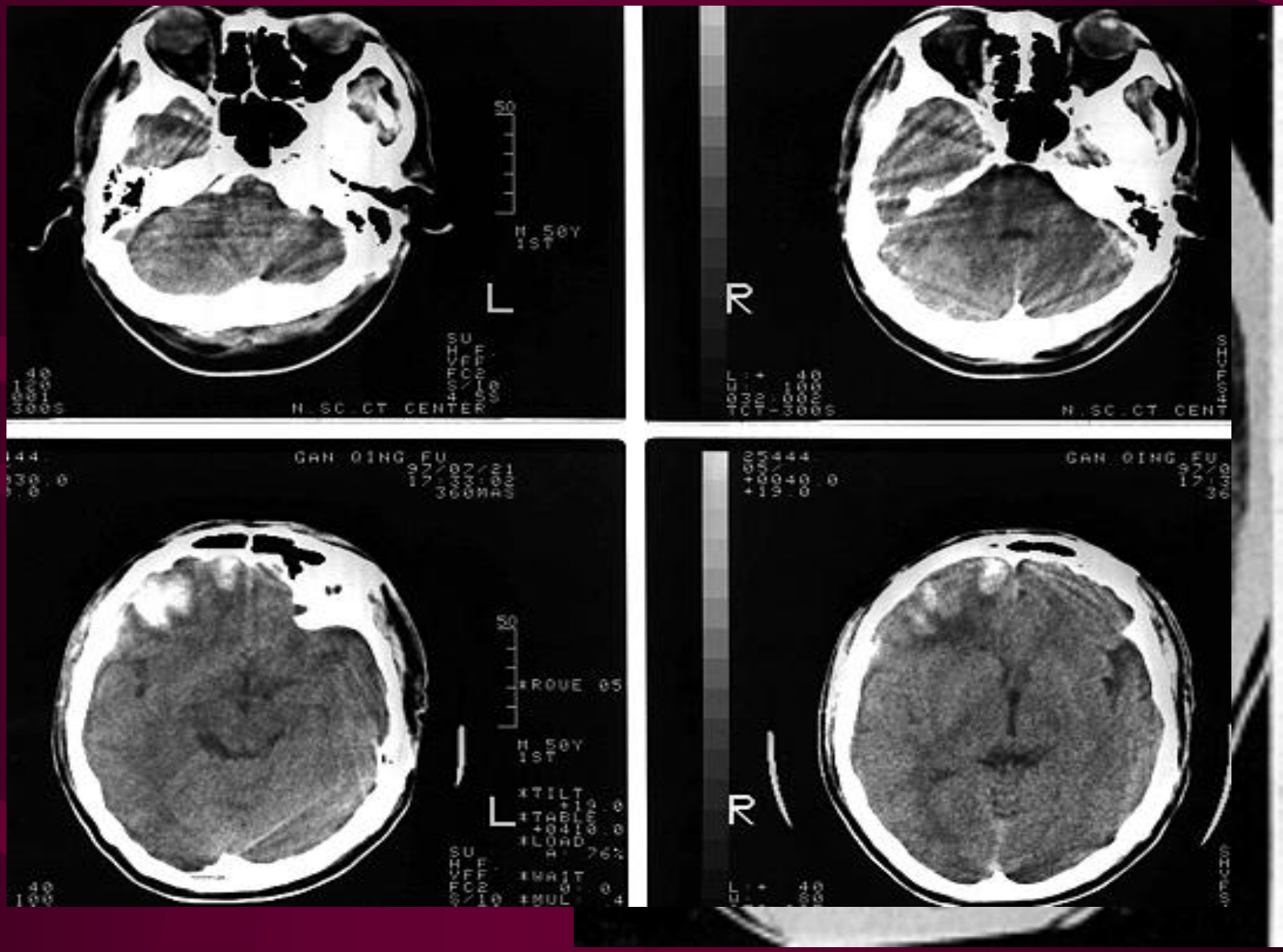


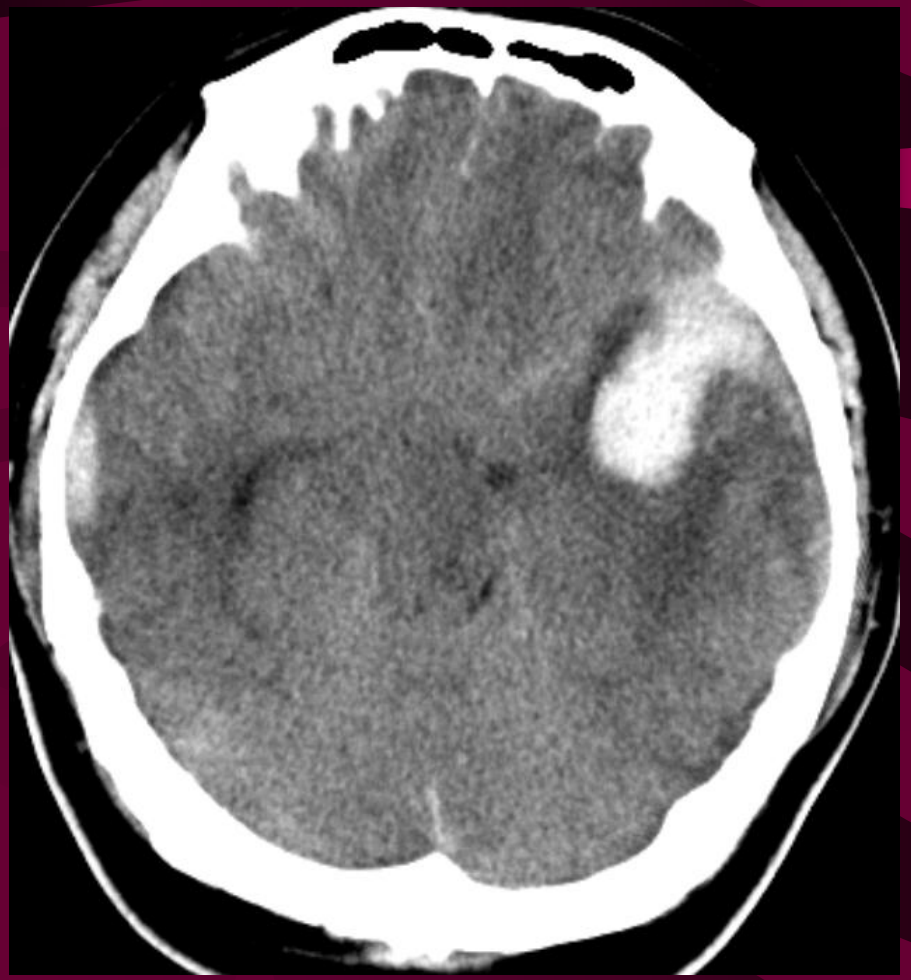
外伤

脑内小血肿

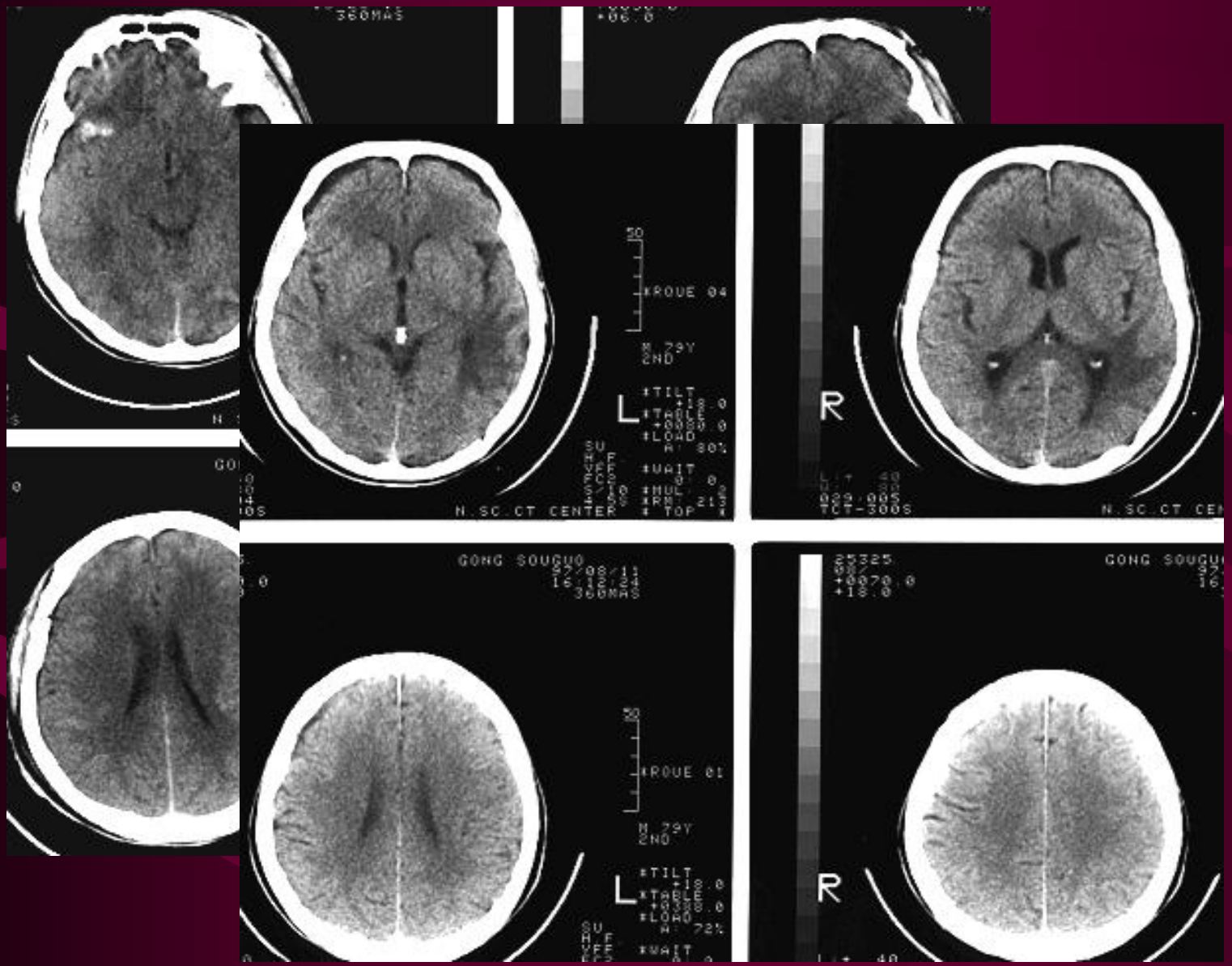
脑内血肿—CT表现

周围有水肿、占位效应





脑内血肿－CT表现



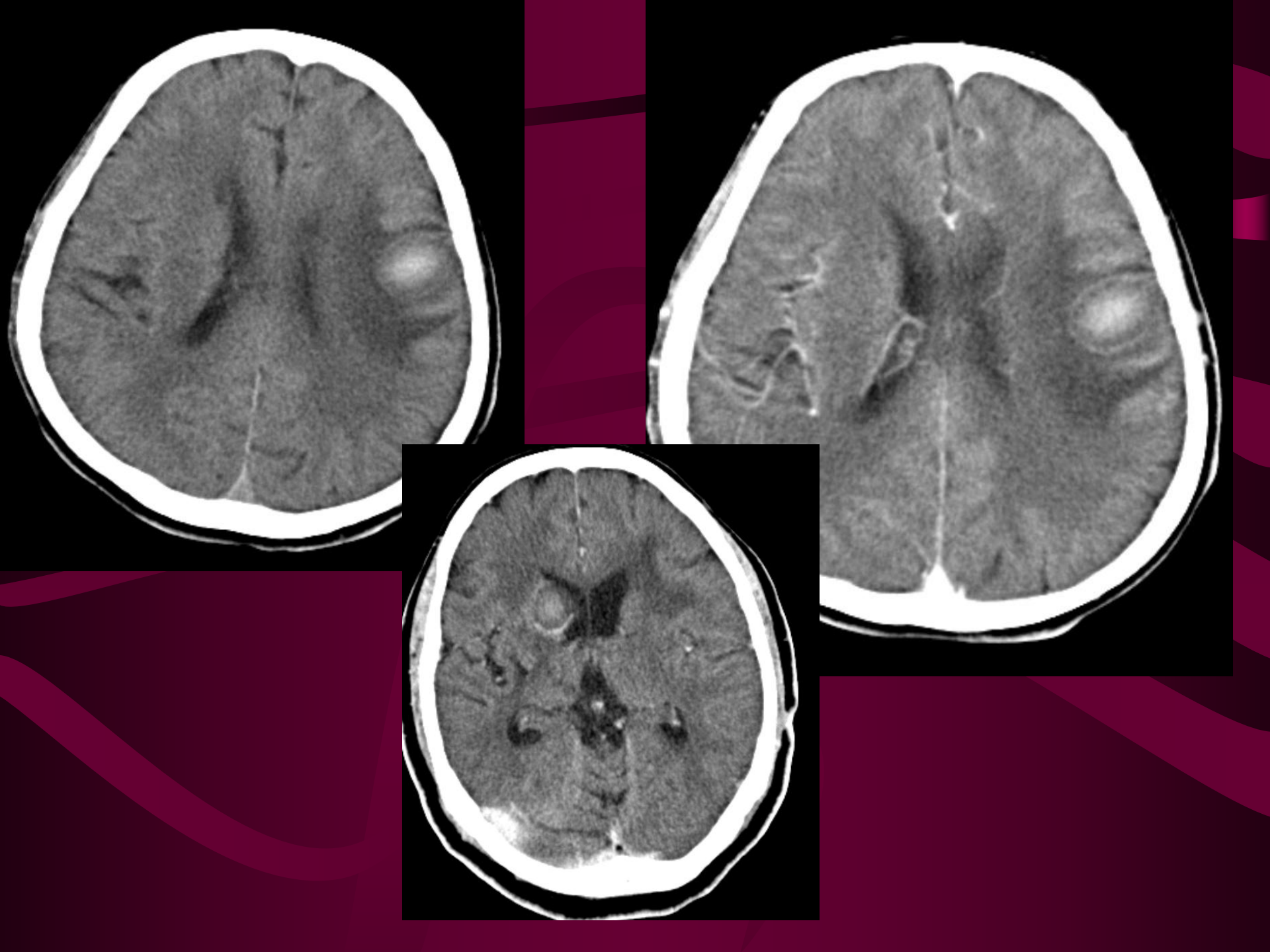
血肿自周边吸收，2～4周为等密度，4周后为低密度

脑内血肿－CT表现

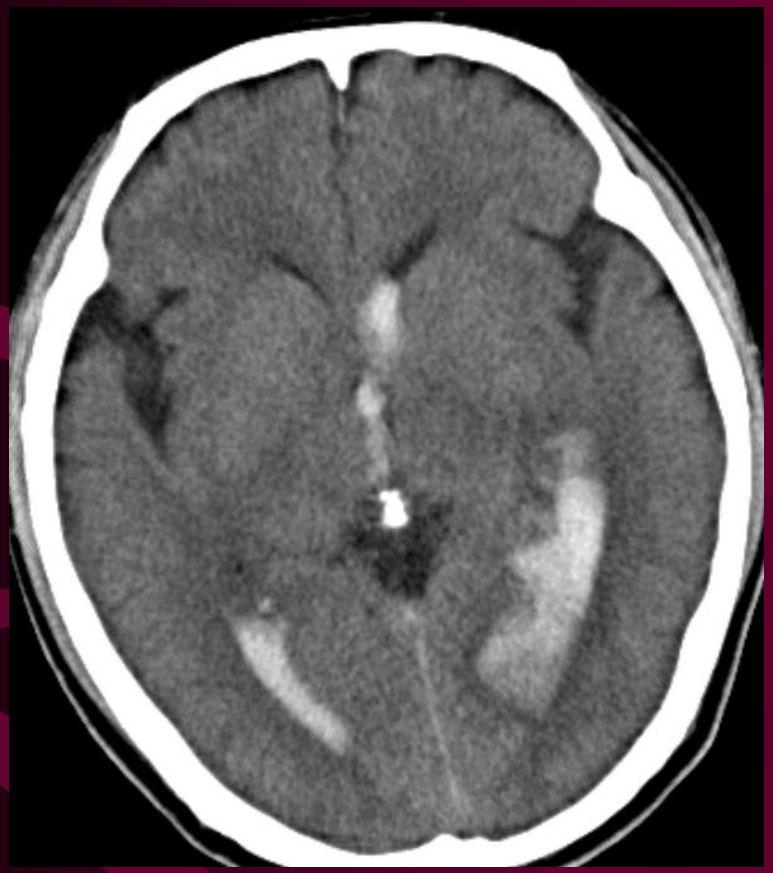
血肿进入慢性期，血肿周围有包膜形成，增强扫描可见强化。

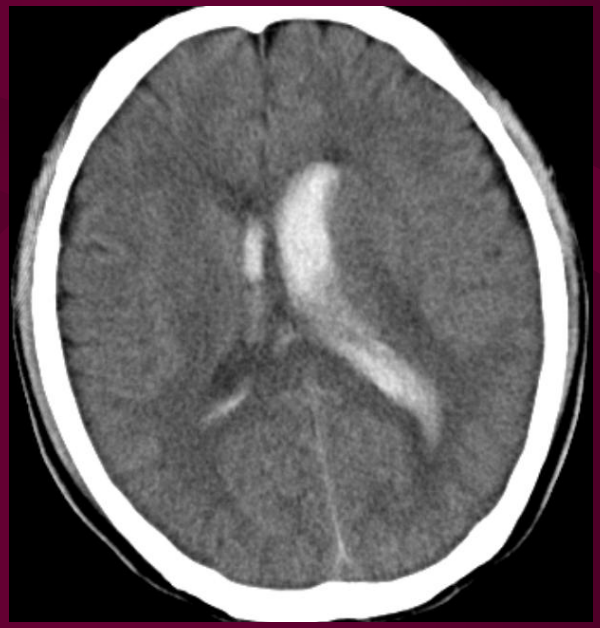
3～5周出现率高。

胶质增生所致。



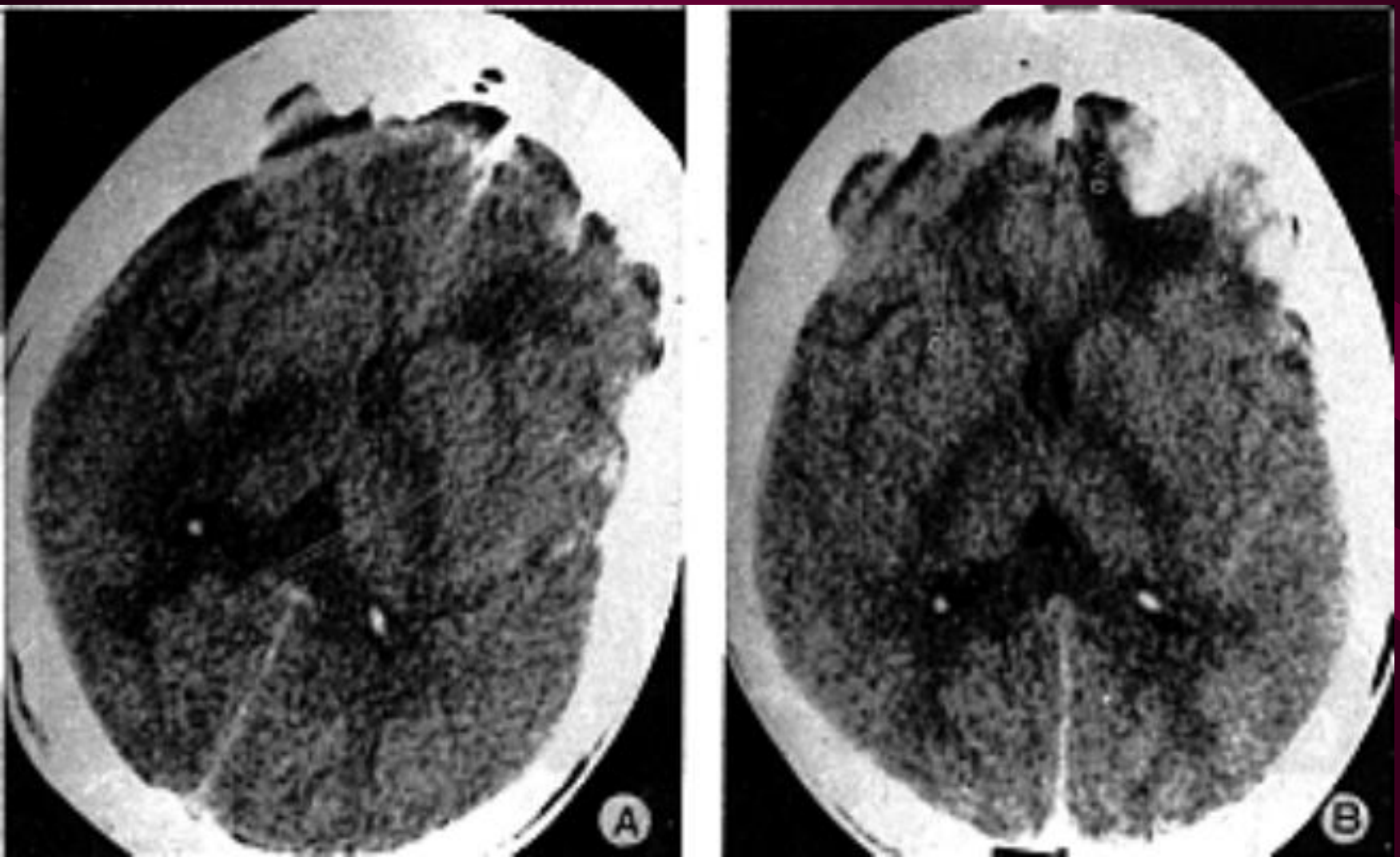
脑内血肿—CT表现





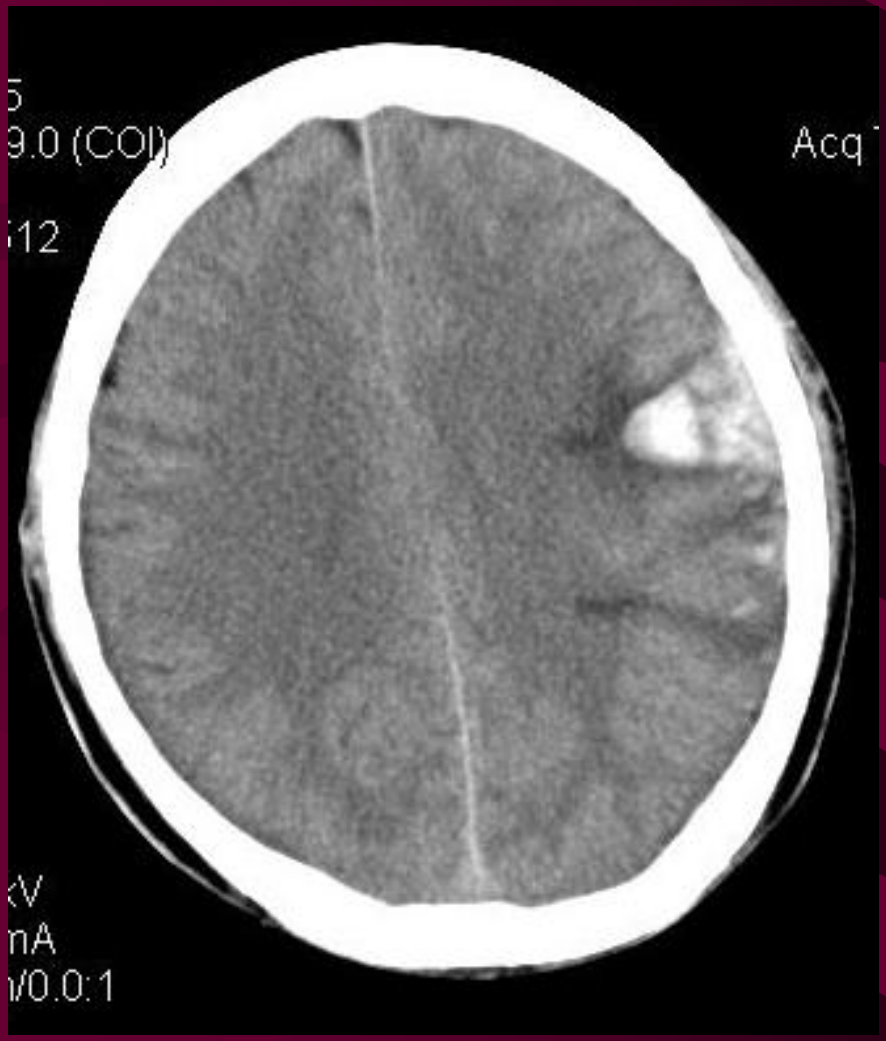
血肿可破入脑室

脑内血肿－CT表现



迟发血肿，预后差

06-11-16



06-11-17

脑内血肿—MRI表现

急性早期：
T1W等信号
T2W等信号
急性期：
T2W低信号
周围水肿
T1W低信号
T2W高信号

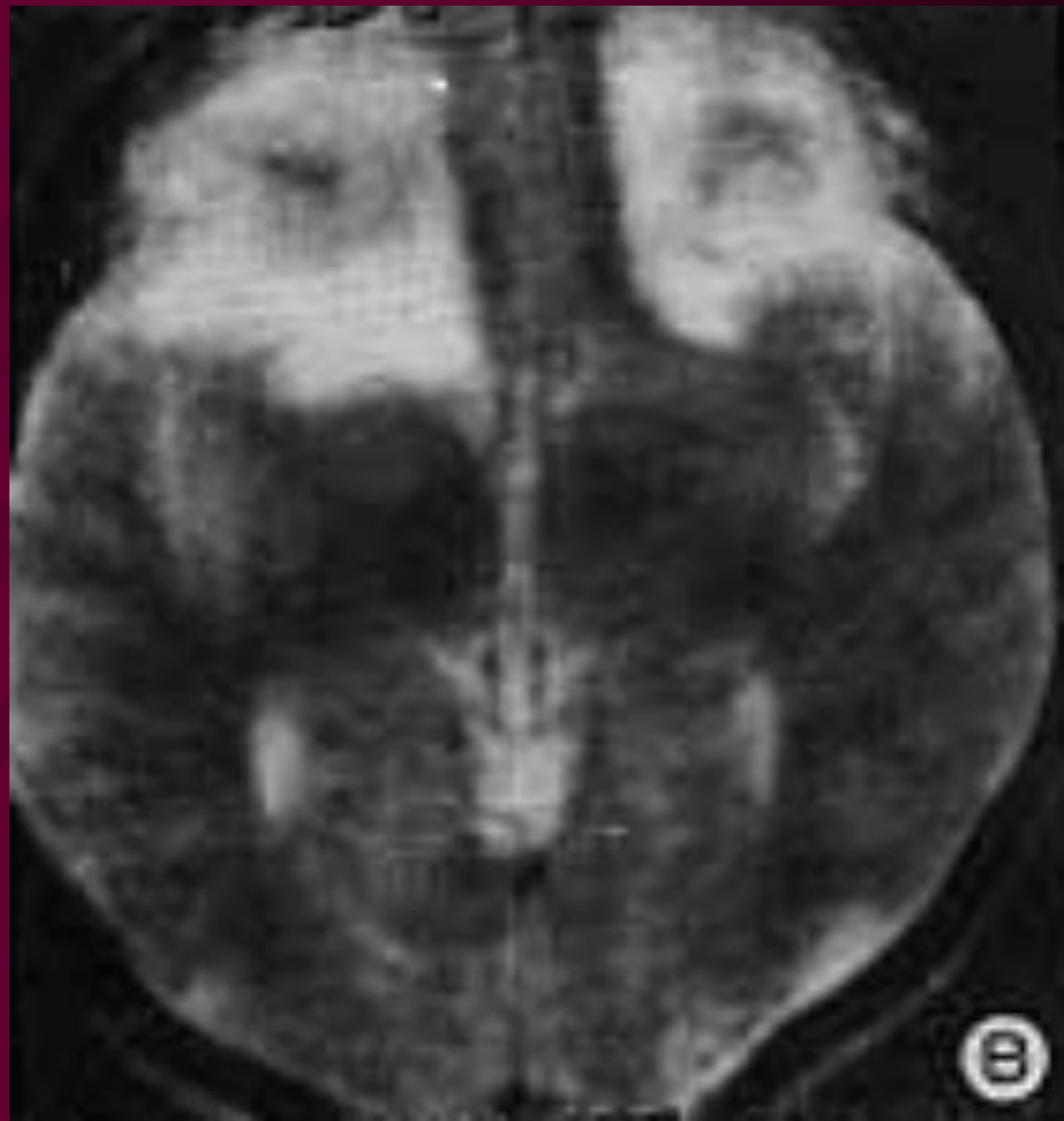
脑内血肿—MRI表现

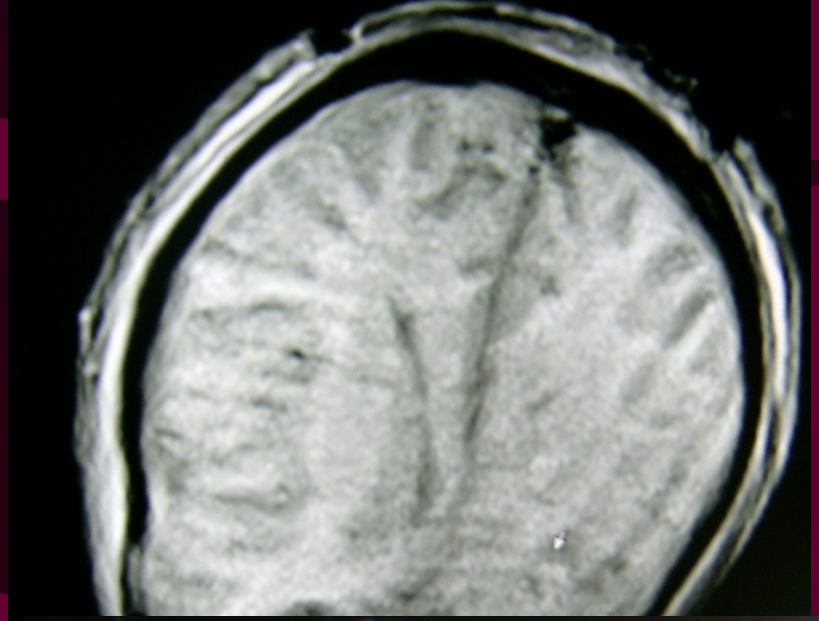
亚急性和慢性

T1W高信号，

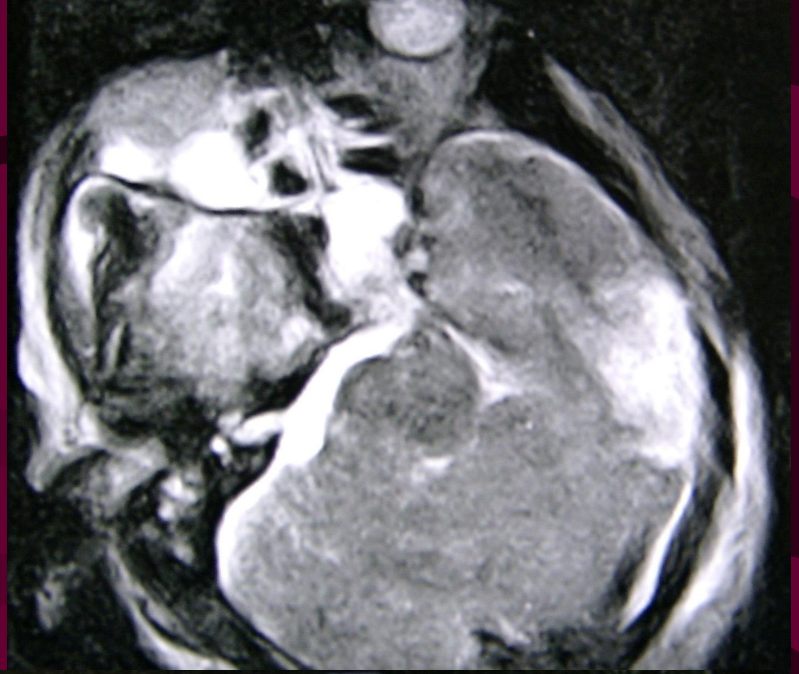
中央等信号；

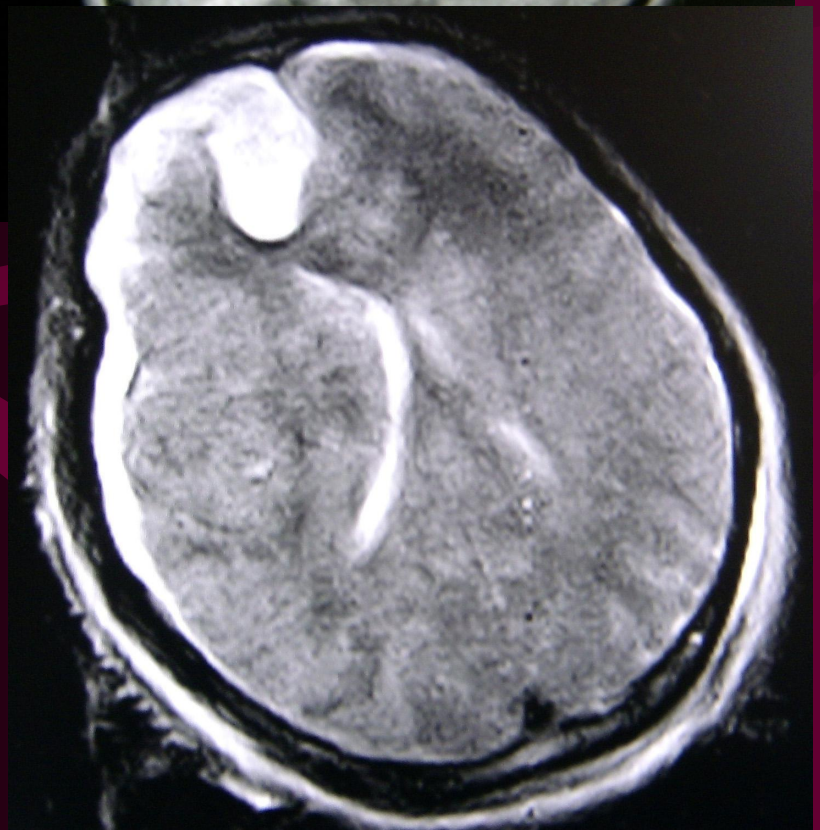
T2W高信号。

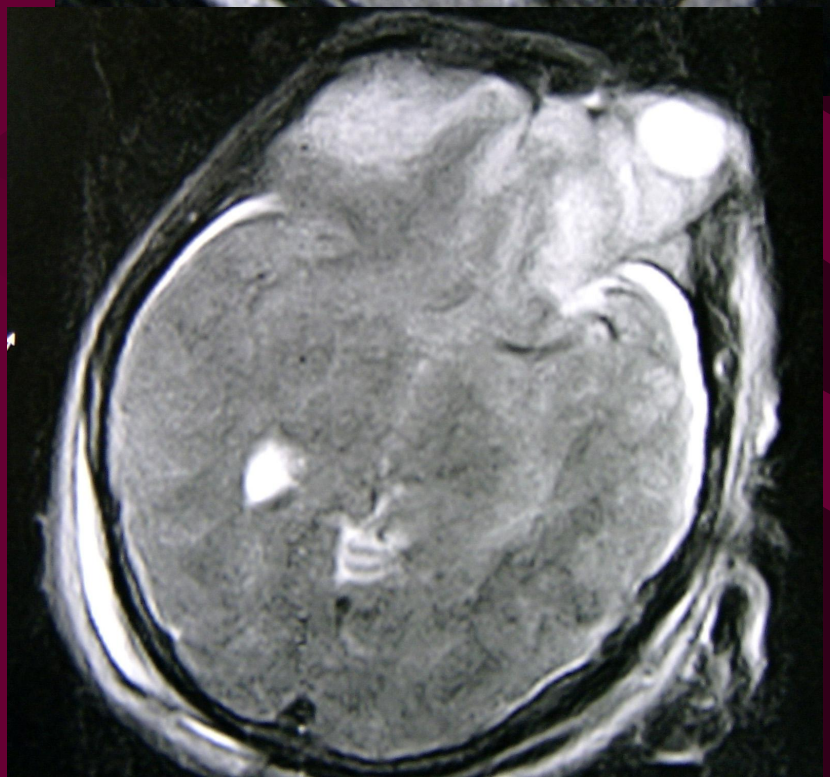


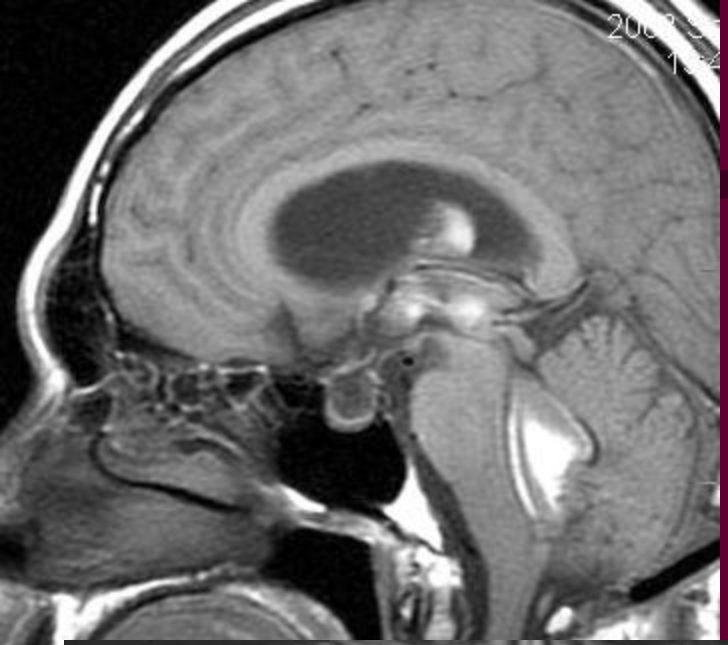


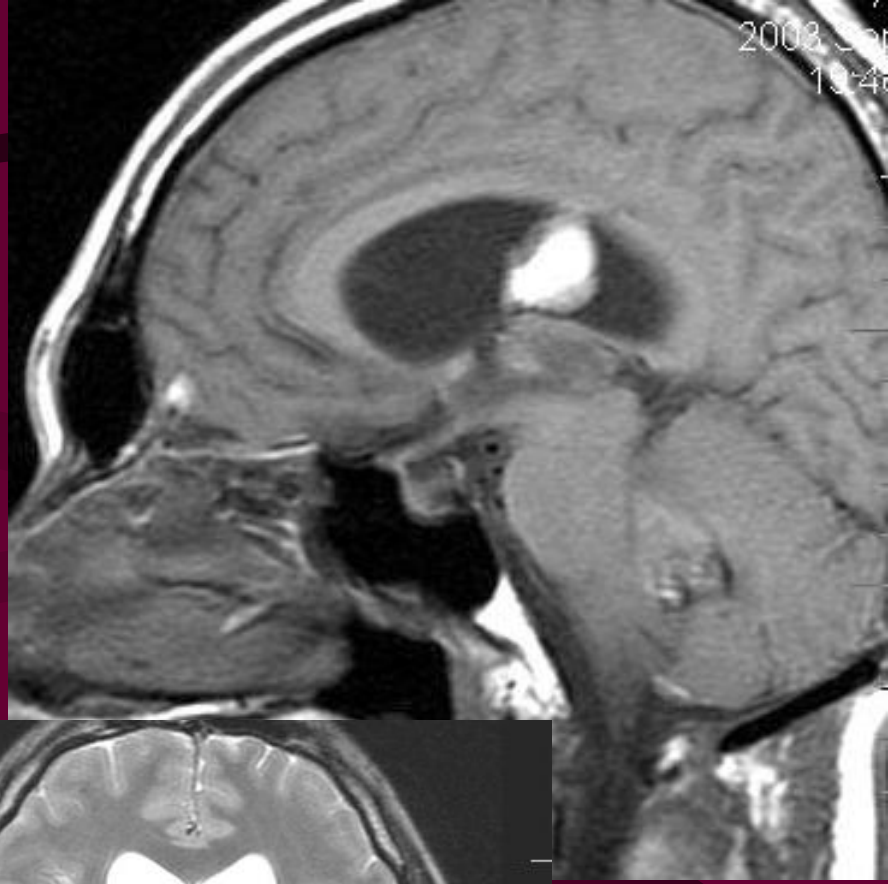
脑挫伤伴血肿












12
Dx
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7
P
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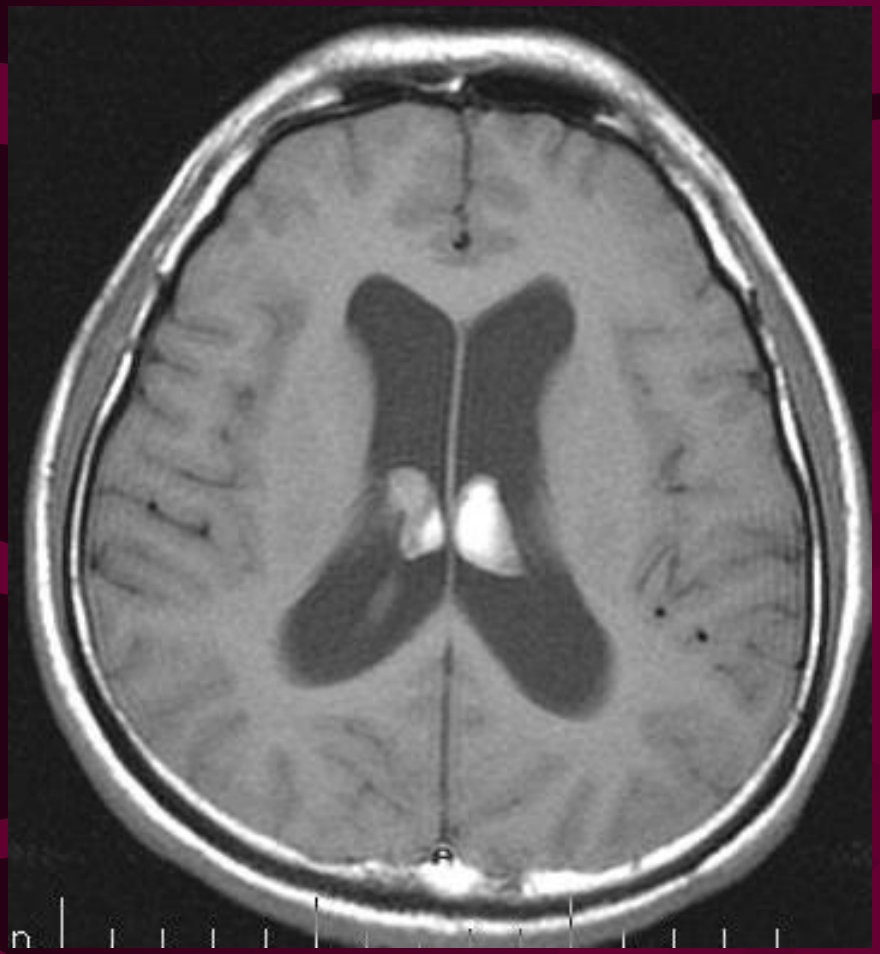
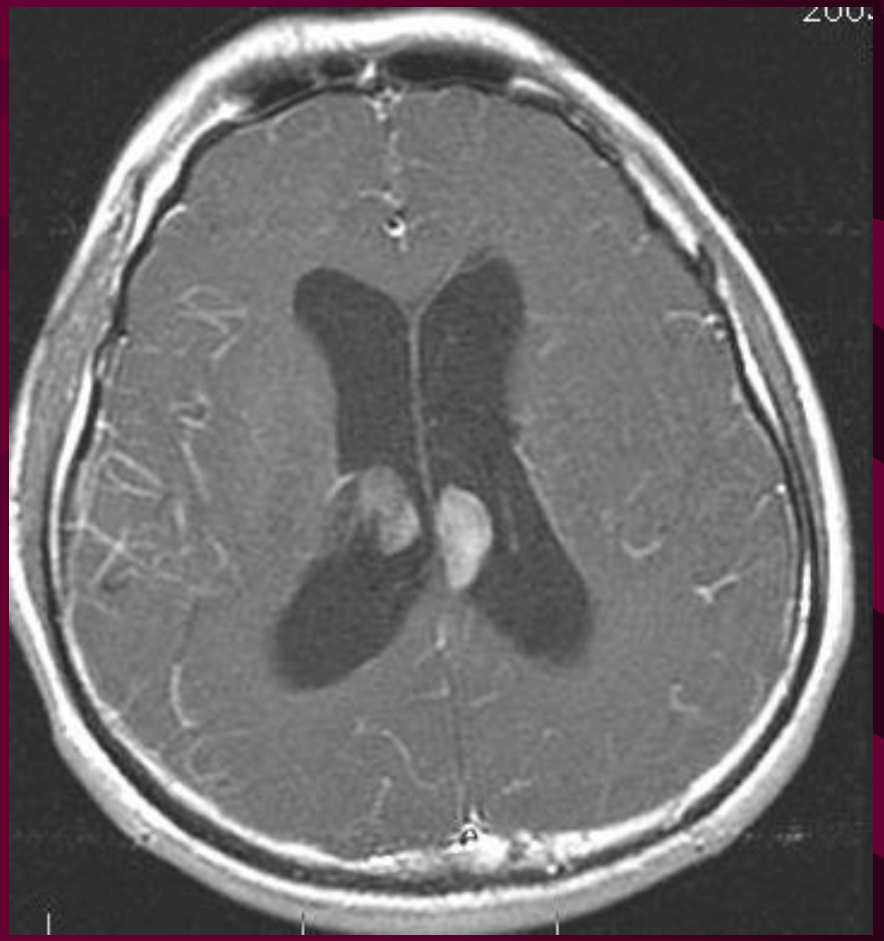
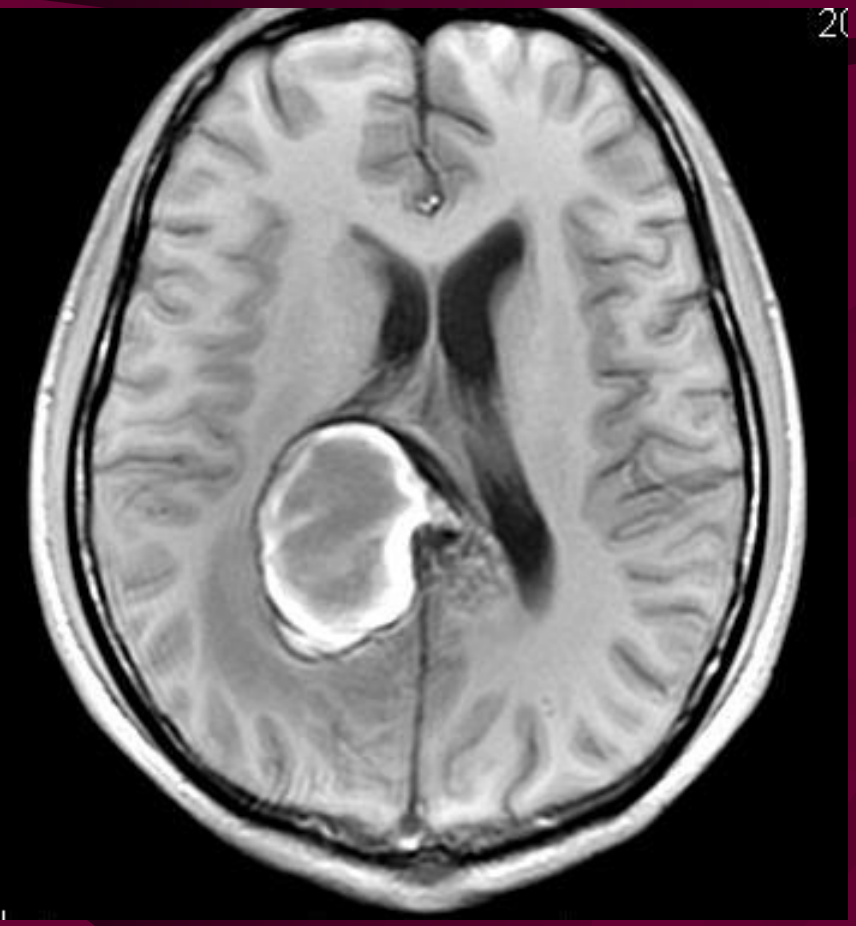
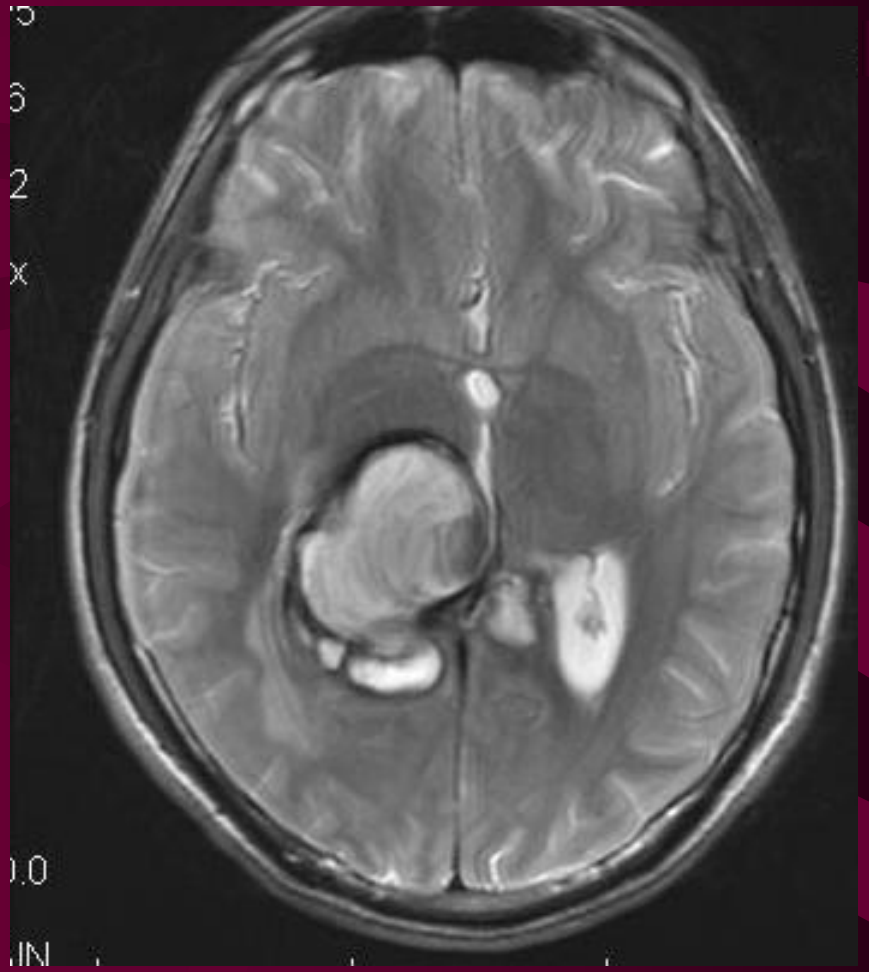
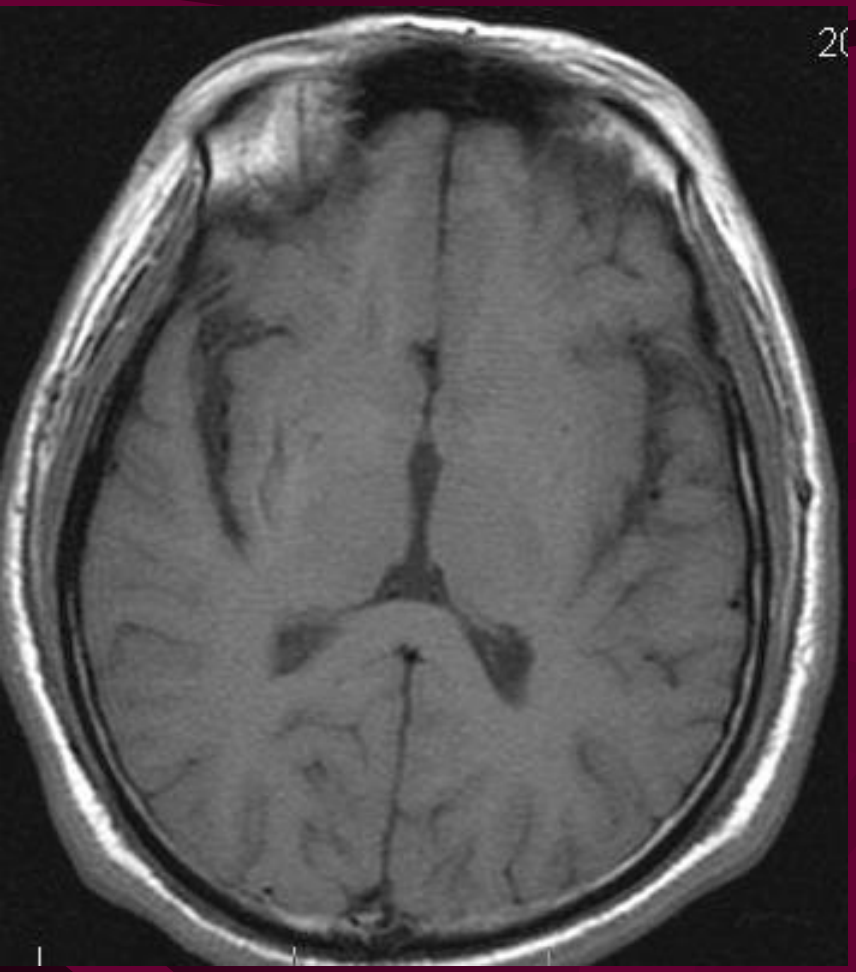
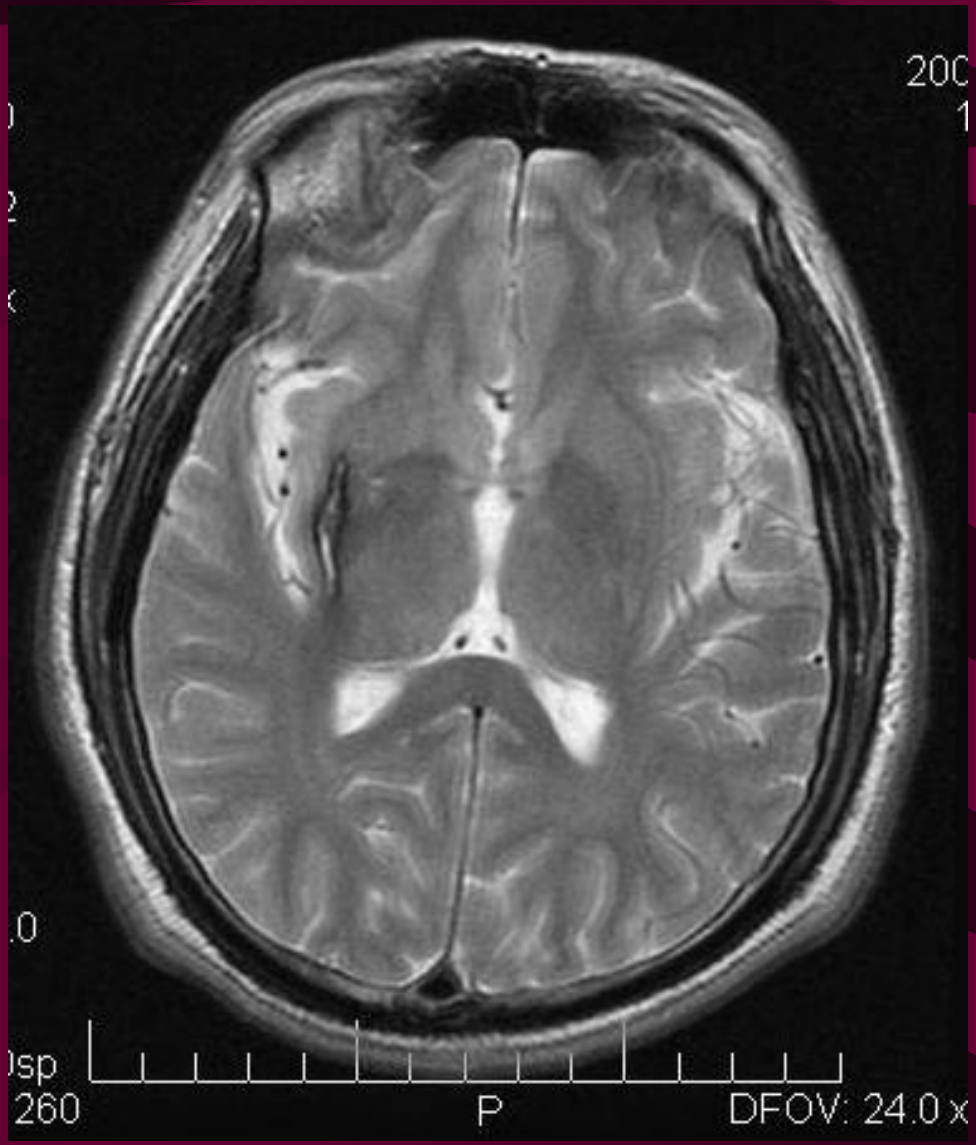












血肿吸收期

石象湖郁金香

脑挫裂伤

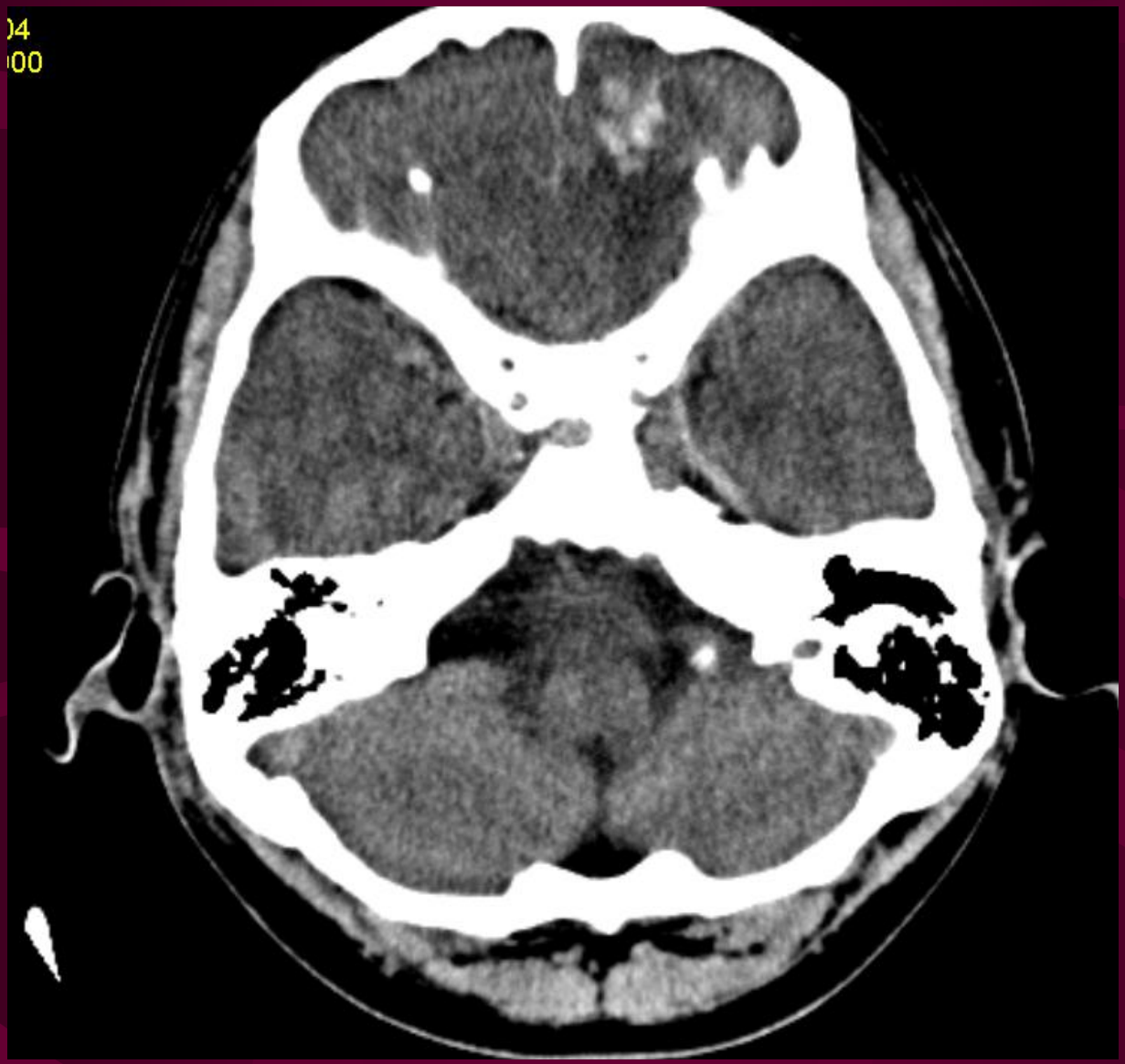
外伤引起的局部脑水肿、坏死、液化和多发散在小出血

脑挫裂伤－CT表现

低密度

斑点状

高密度



脑挫裂伤

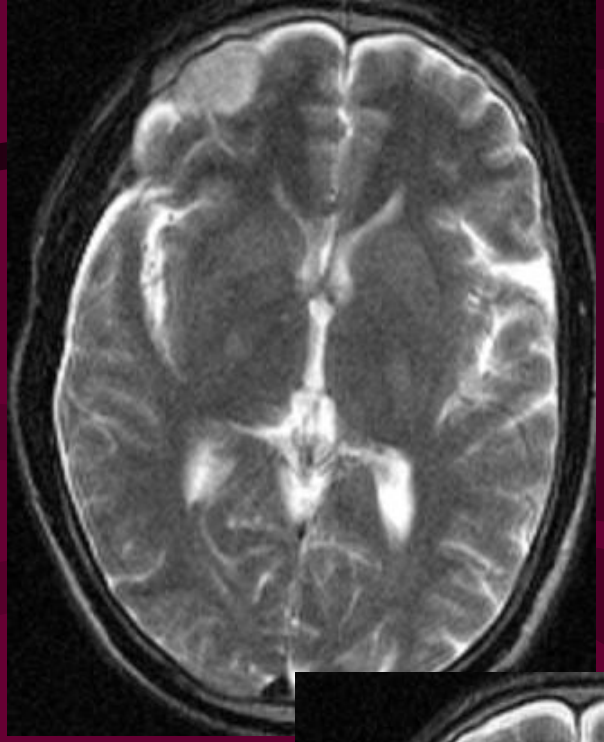
脑挫裂伤—CT表现

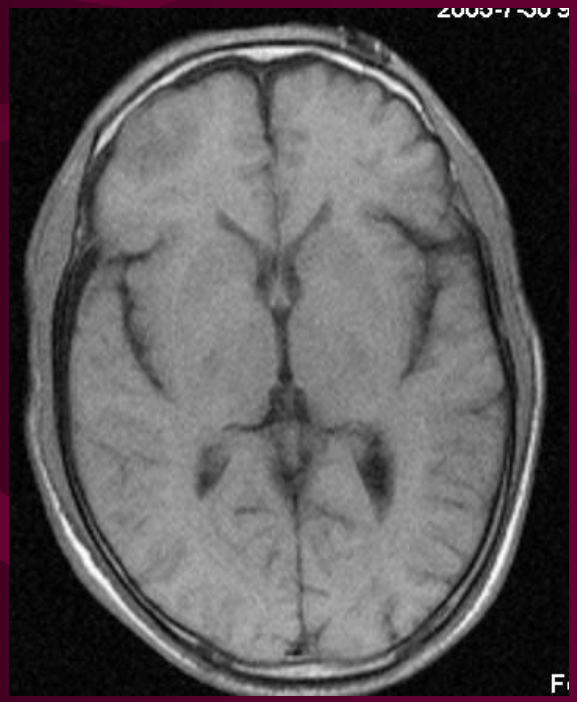
CT可显示伴发的脑内、外血肿和蛛网膜下腔出血，常见于纵裂池 。

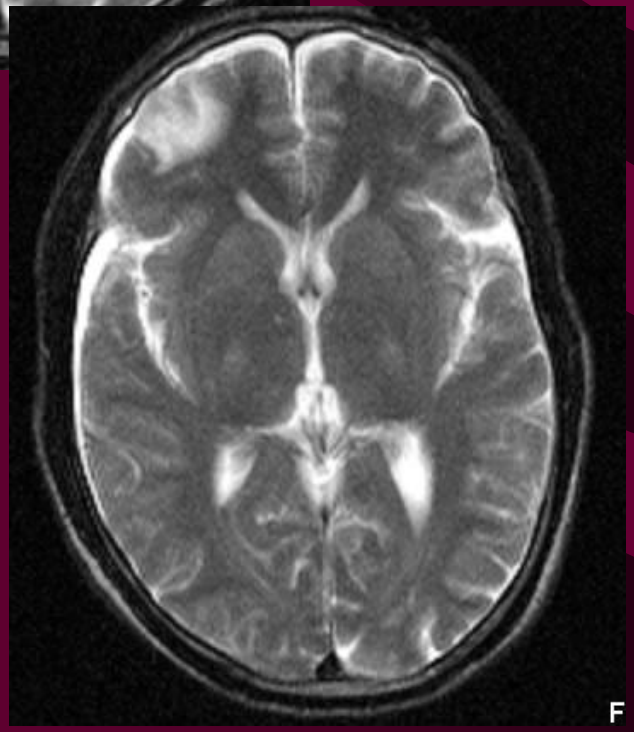
脑挫裂伤－MRI表现

T1W低信号

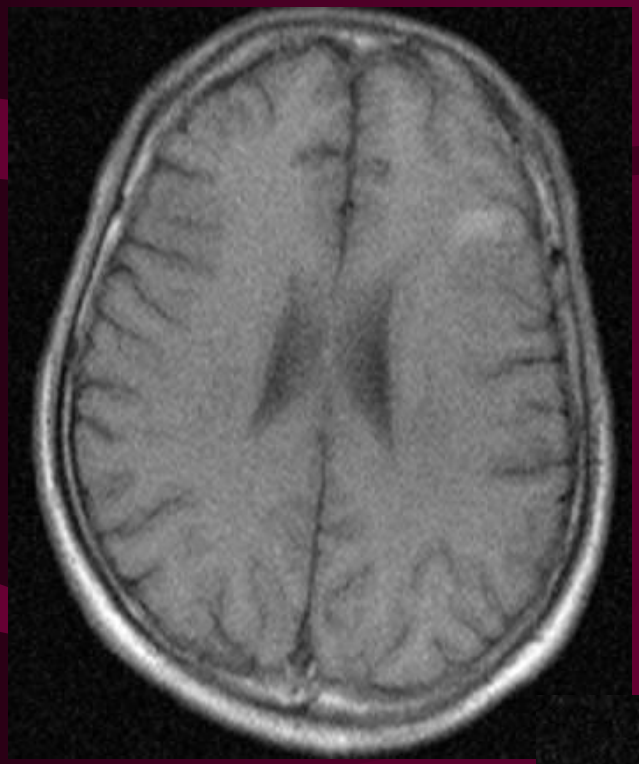
T2W高信号

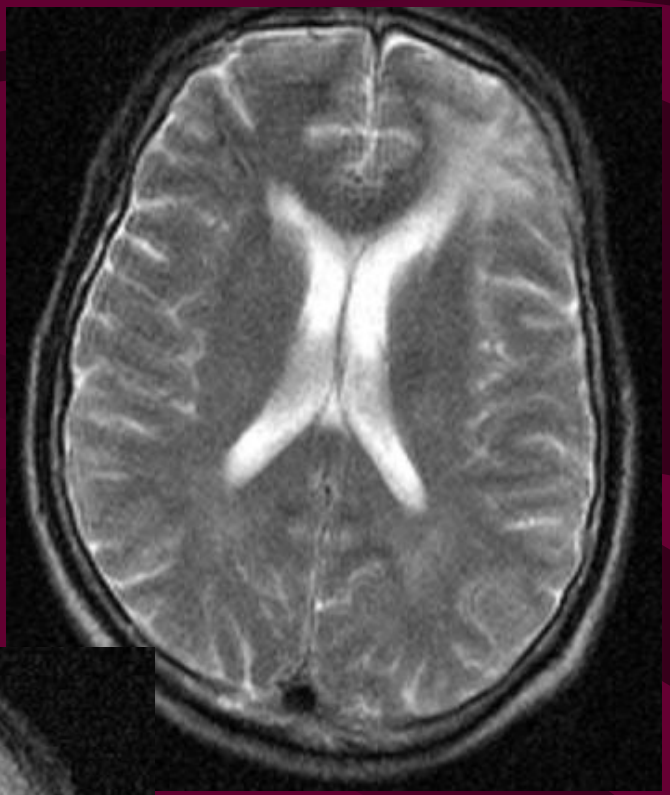


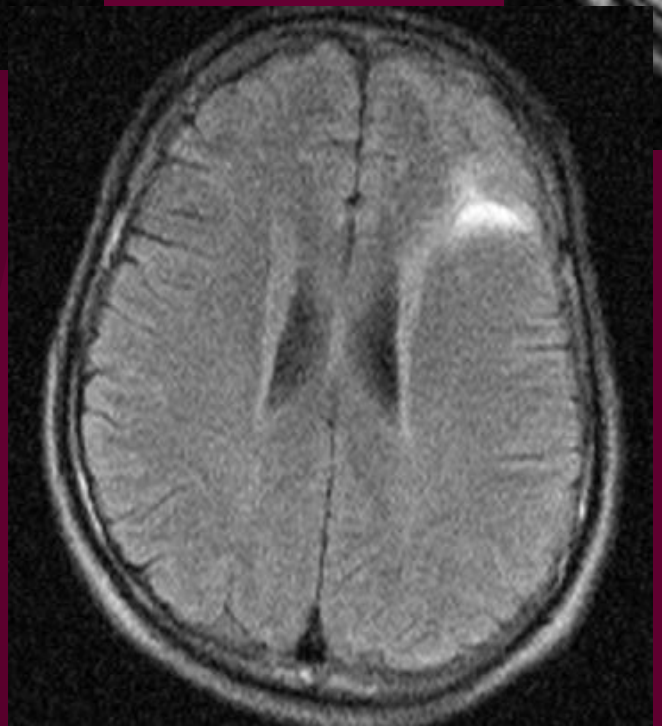


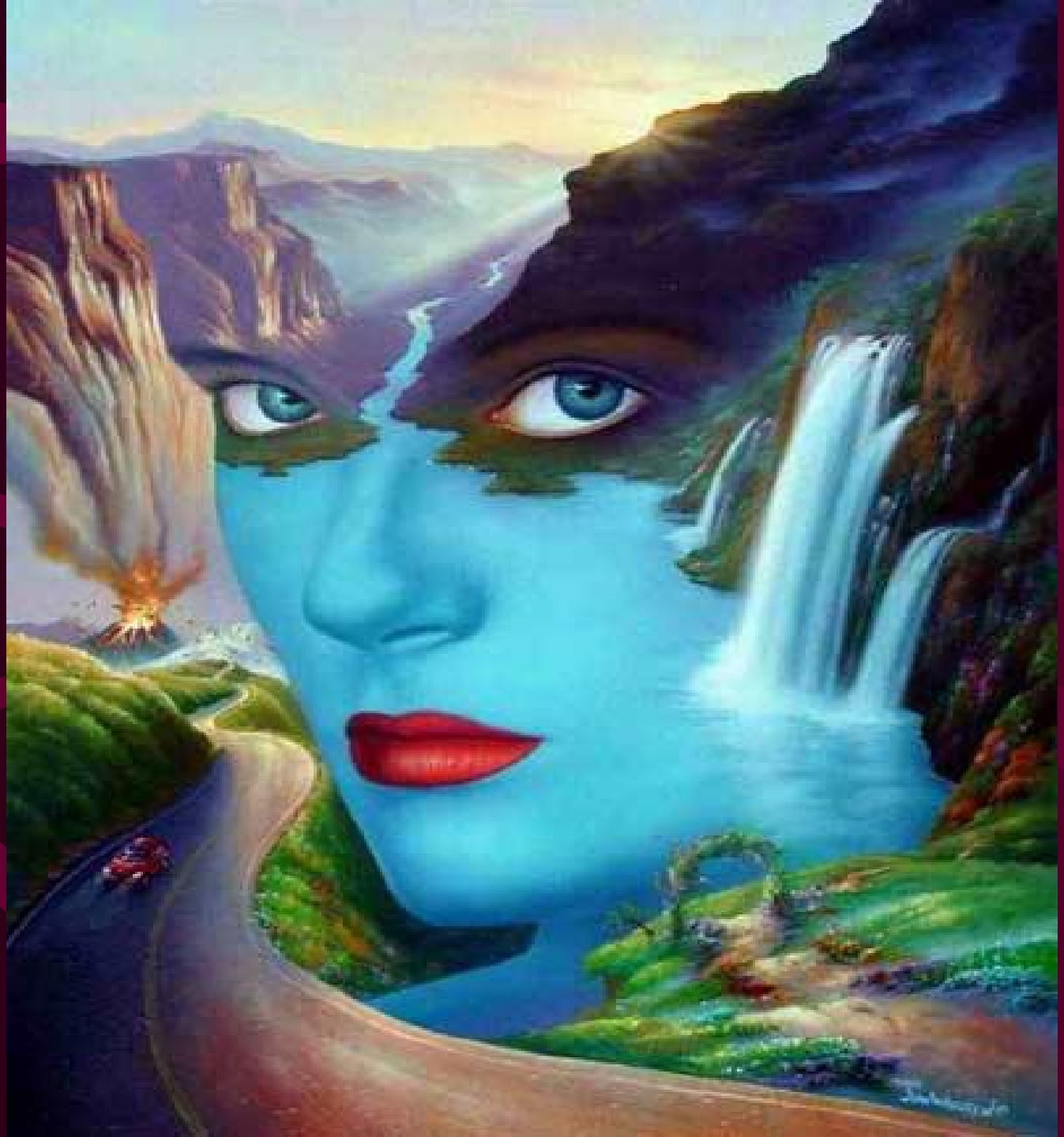


脑挫伤







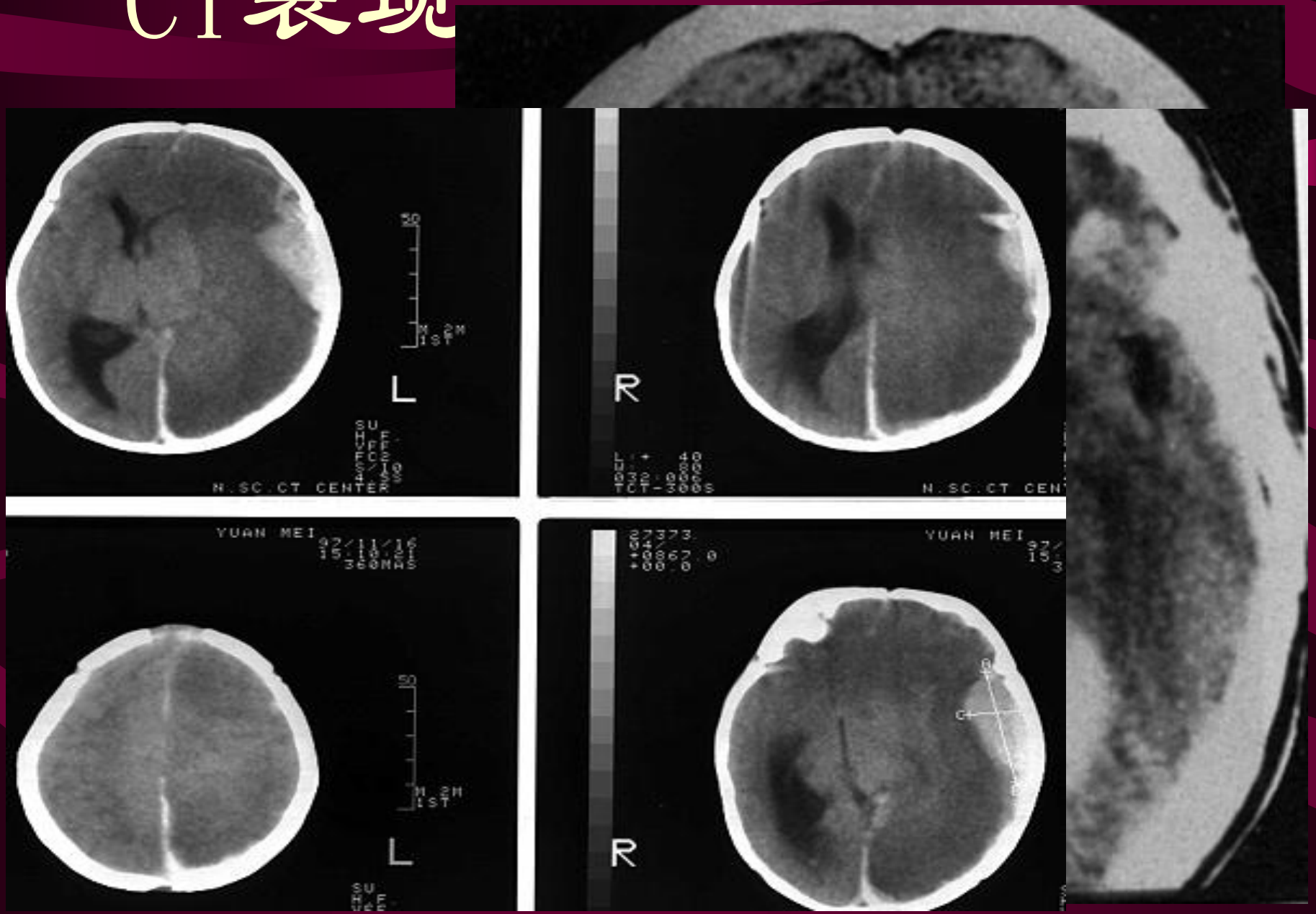


脑室和蛛网膜下腔出血

1、外伤性脑室出血少见。

2、蛛网膜下腔出血表现为脑池和脑沟增宽，或结构不清，密度增高

CT表现




(COl)
Acq Tm: 1
0:1


COl)
Acq Tm:
:1

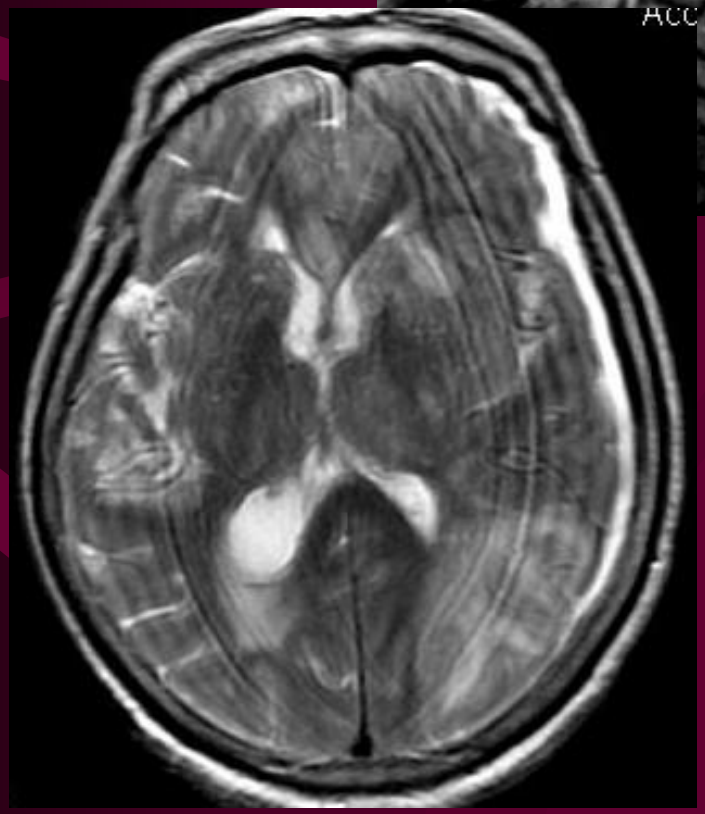
MRI表现

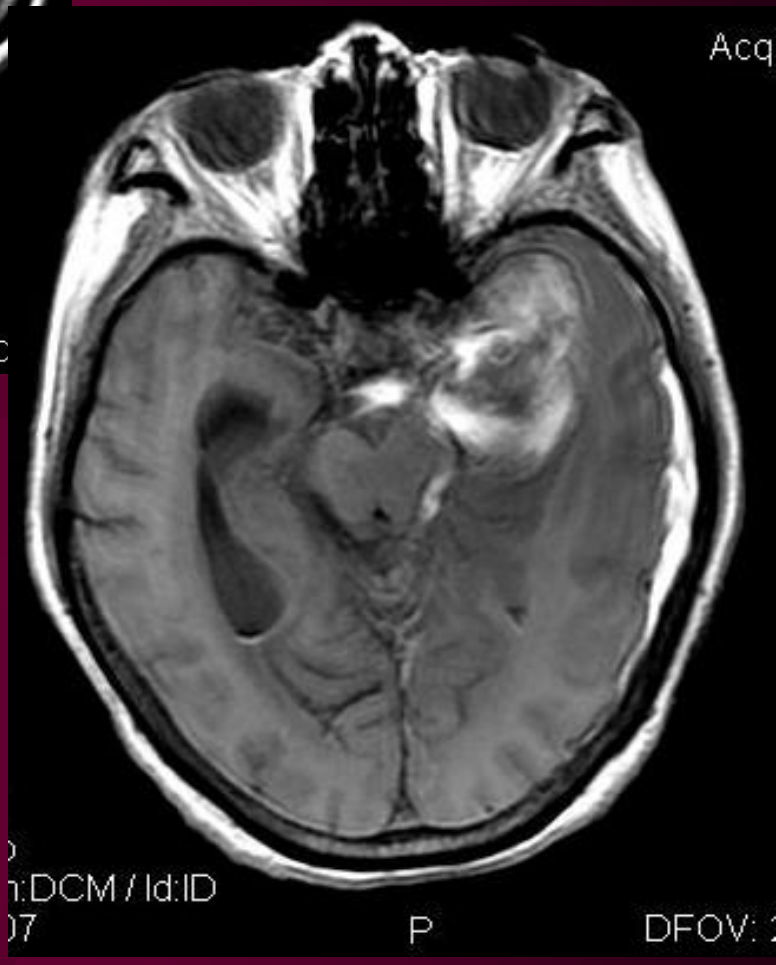
急性期：T1W和T2W的信号与脑脊液类似，难以显示

亚急性期：T1W和T2W均为高信号

慢性期：同急性期


2
24.4 (COI)
92
Acq

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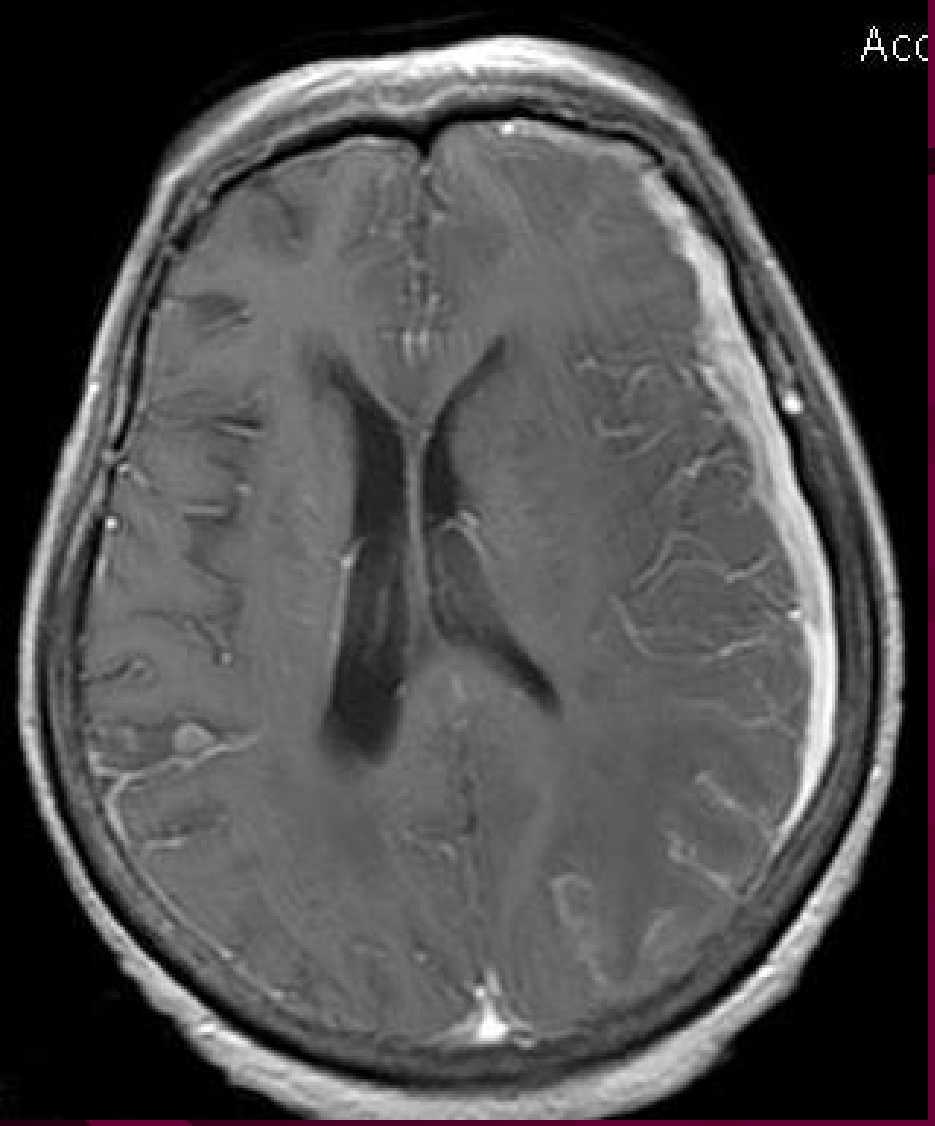
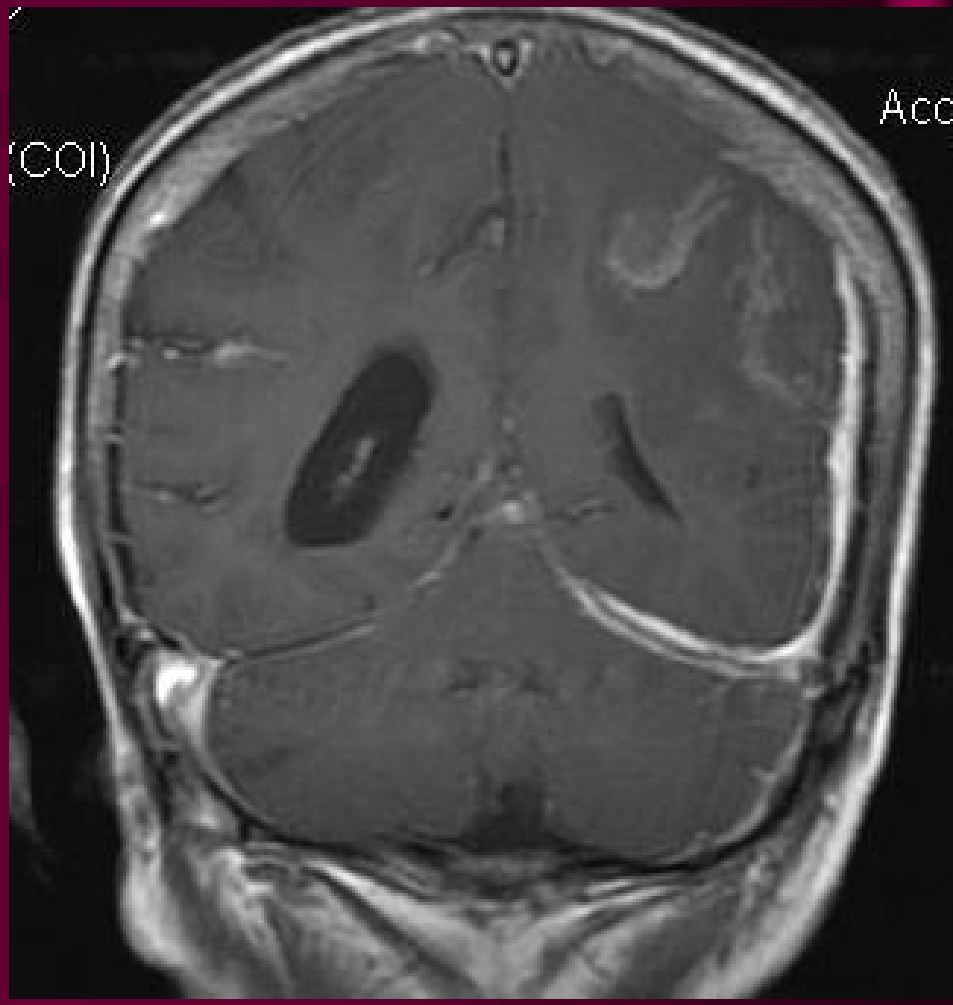


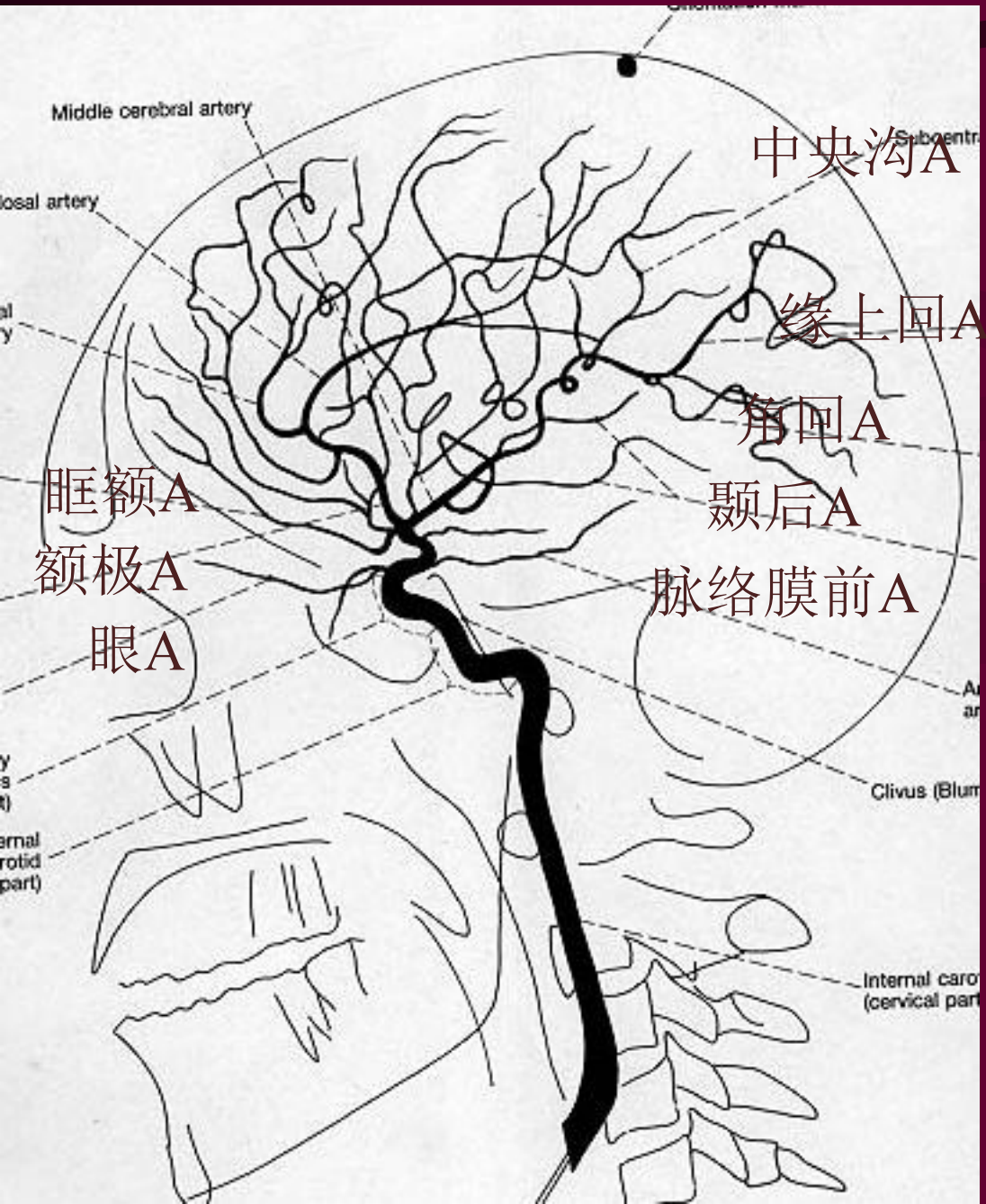


新武松打虎！

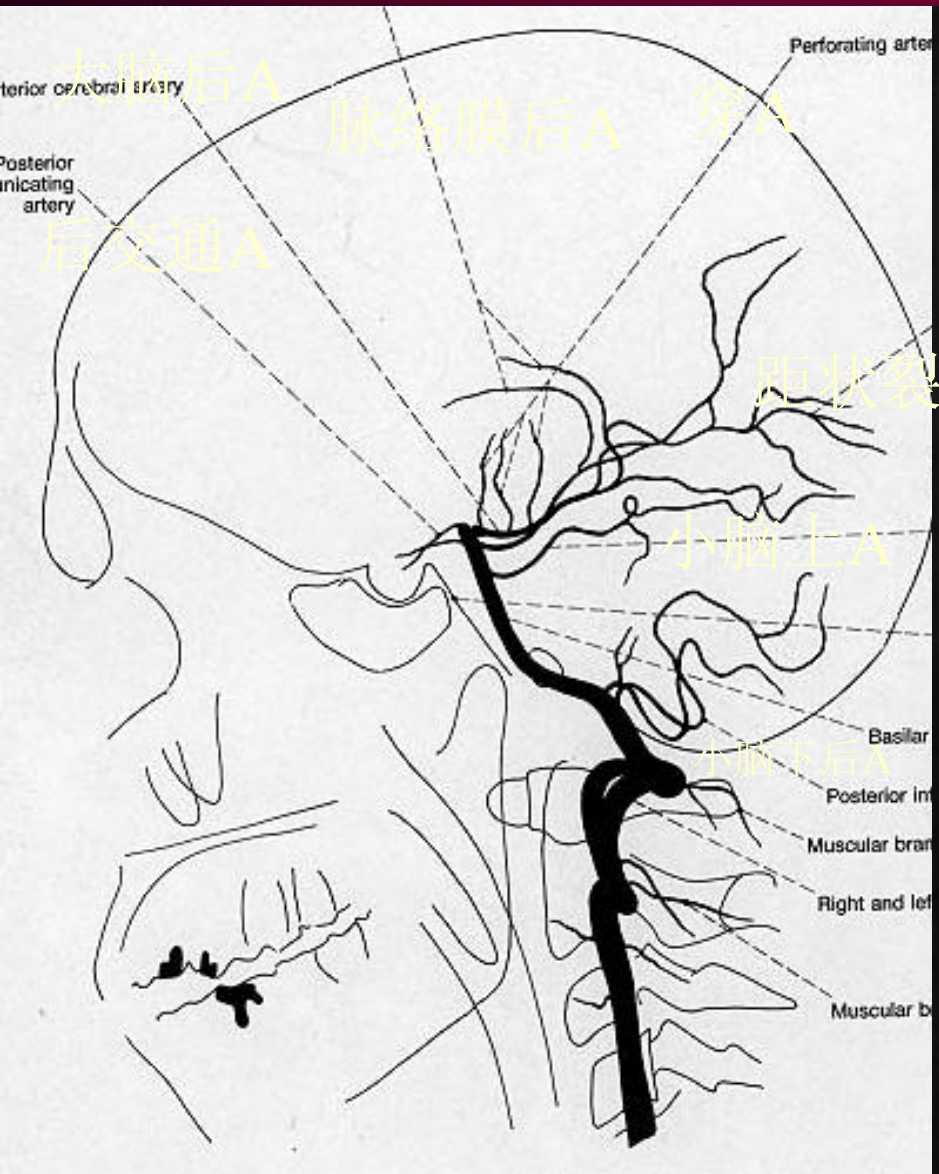
脑血管疾病影像诊断

川北医学院

翟昭华


Middle cerebral artery
中央沟A
缘上回A
角回A
颞后A
脉络膜前A
眶额A
额极A
眼A
Clivus (Blum
Internal caro
(cervical part

椎动脉—动脉期


大脑后A
脉络膜后A
室A
后交通A
Perforating arte
terior cerebral artery
Posterior
nicating
artery
脑桥A
小脑上A
小脑下后A
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Posterior in
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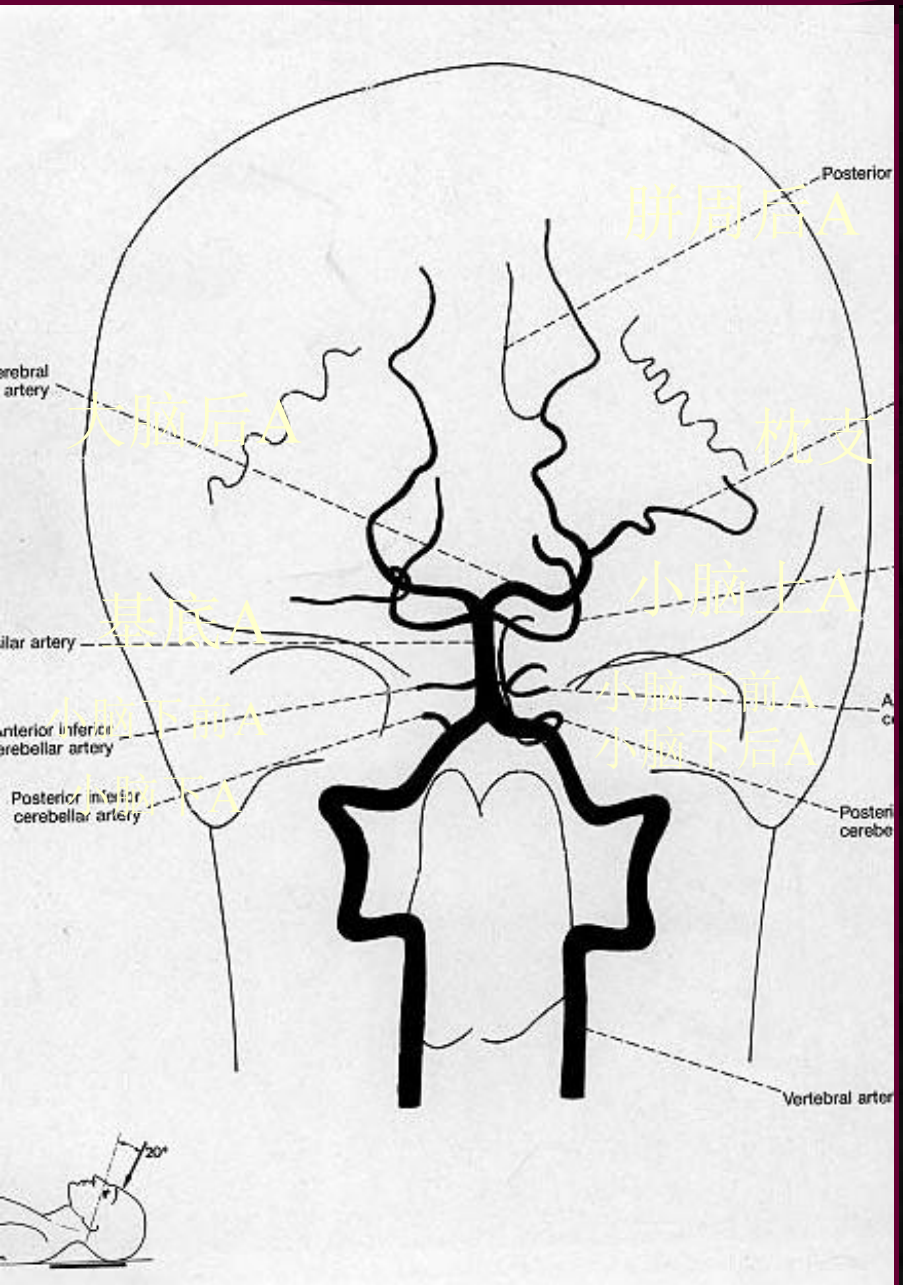
Right and le
Muscular b


Posterior
erebral
artery
ilar artery
nterior inferior
erebellar artery
Posterior inferior
cerebellar artery
Posteri
cerebe
Vertebral arter
20°

脑 血 管 疾 病

- 脑动脉瘤
- 血管畸形
- 脑血管意外
- 脑出血
- 蛛网膜下腔出血
- 脑血管闭塞

颅内动脉瘤intracranial aneurysms

颅内动脉瘤是指发生于颅内动脉的局灶性异常扩大。

发生于任何年龄，1/3在20～40岁，1/2以上在40岁以后发病

男：女＝ 4：6 ；发病率0.9%。

51%的蛛网膜下腔出血是由于动脉瘤破裂所致。

CT、MRI可显示部分动脉瘤，血管造影是黄金诊断标准

颅内动脉瘤—病理

好发于脑动脉，95%分布于颈内动脉系统，5%分布于椎动脉系统。

多—少：大脑前、前交通、后交通、大脑中动脉。

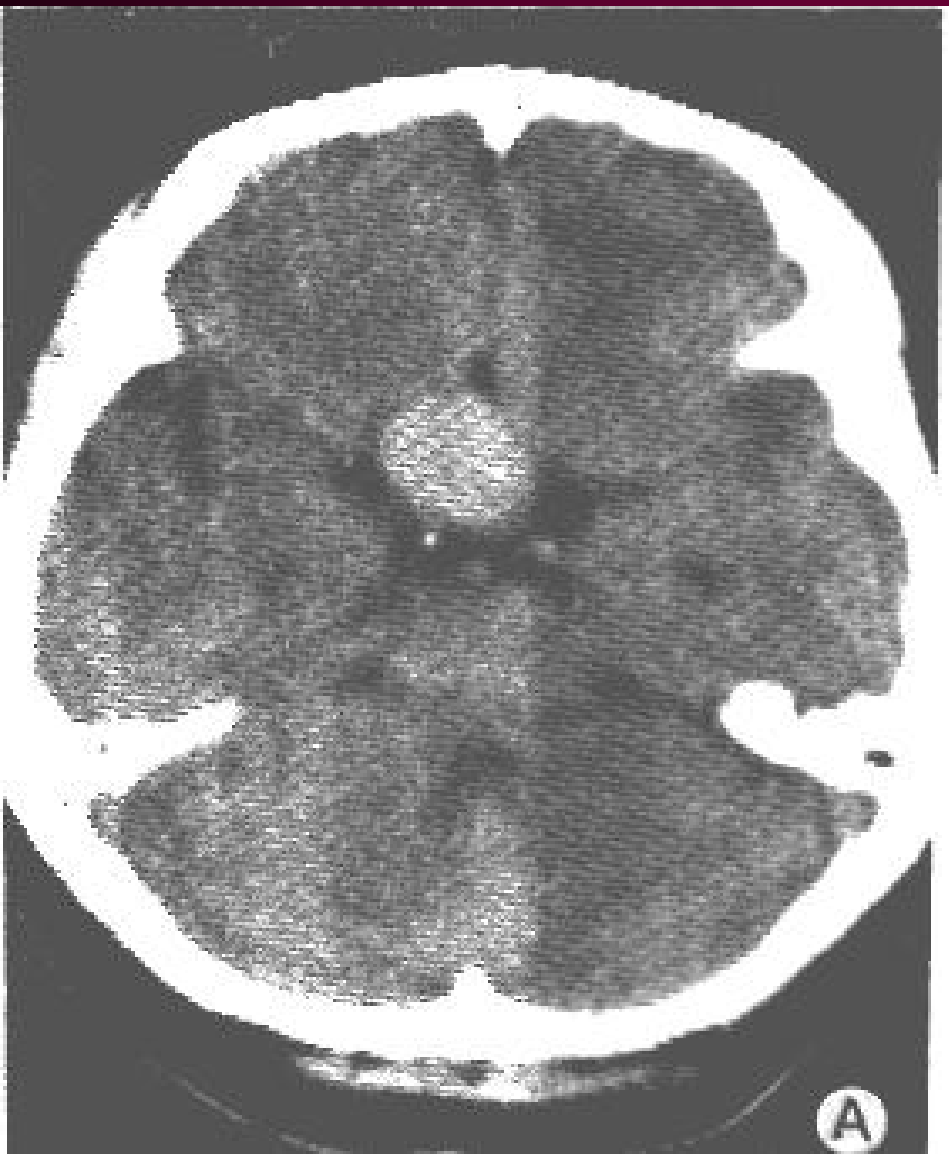
20%为多发。

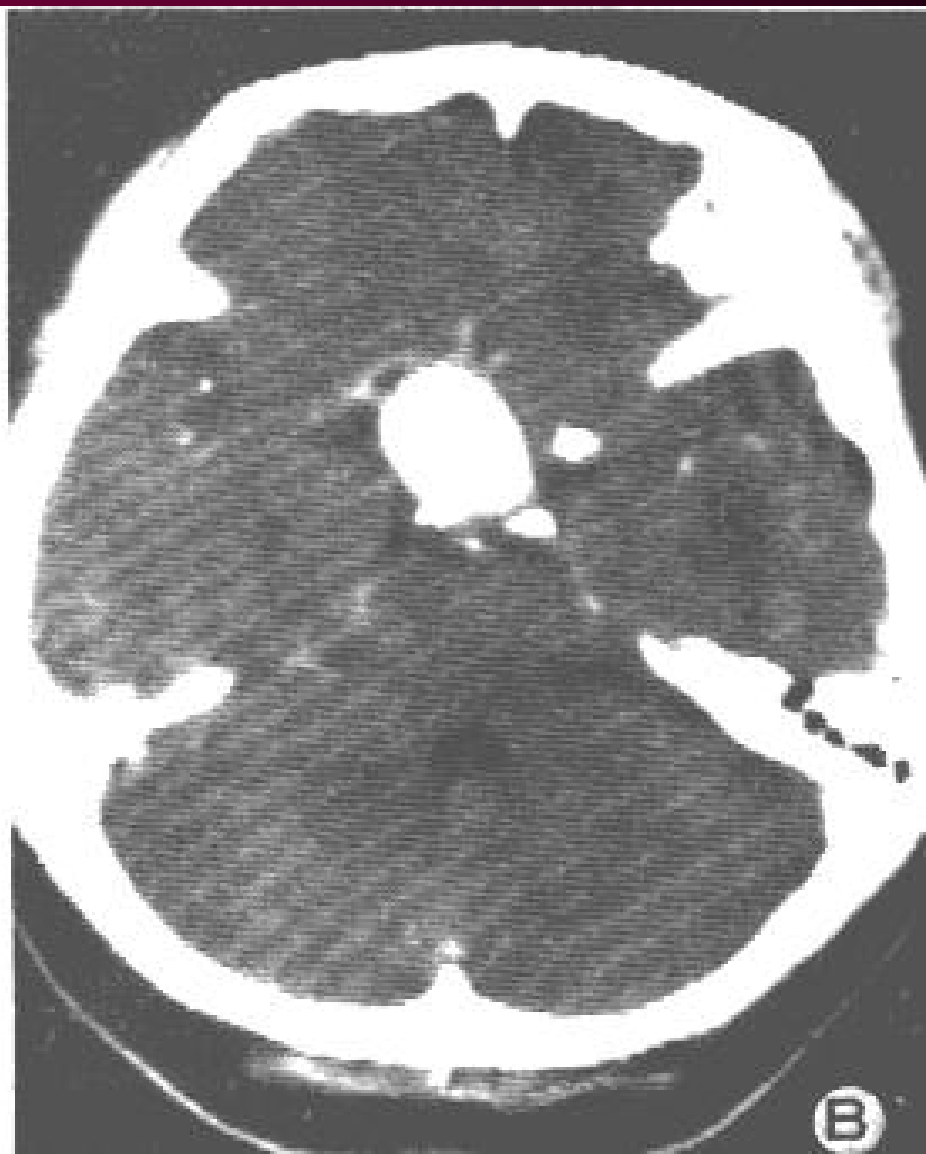
颅内动脉瘤—CT表现

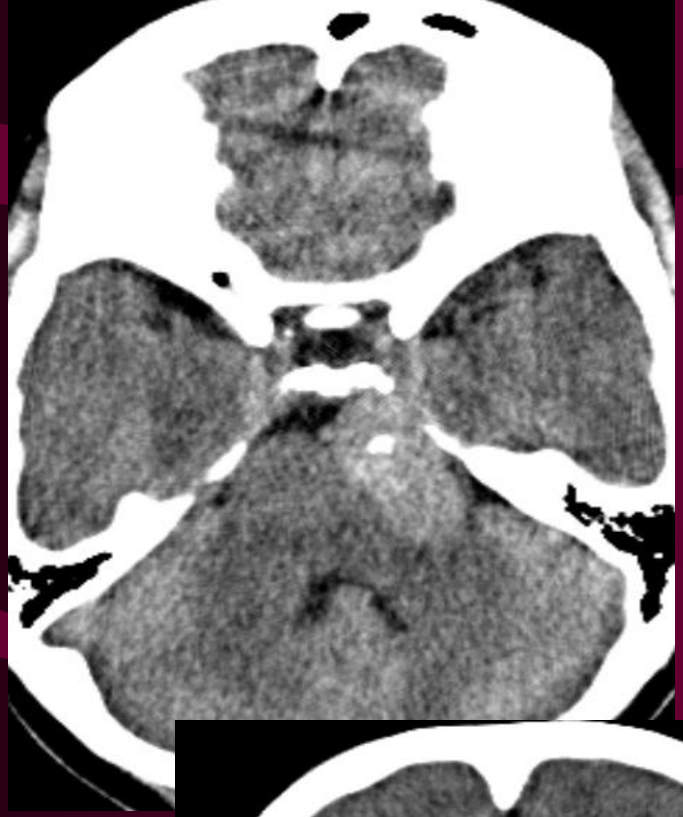
1、平扫：
圆形或条形
稍高密度影
动脉瘤小，
平扫常阴性

平扫显示率
10—30%

颅内动脉瘤—CT表现







颅内动脉瘤—CT表现

3、动脉瘤伴部分血栓形成

平扫：中心稍高密度

其外等密度血栓

周围高密度囊壁

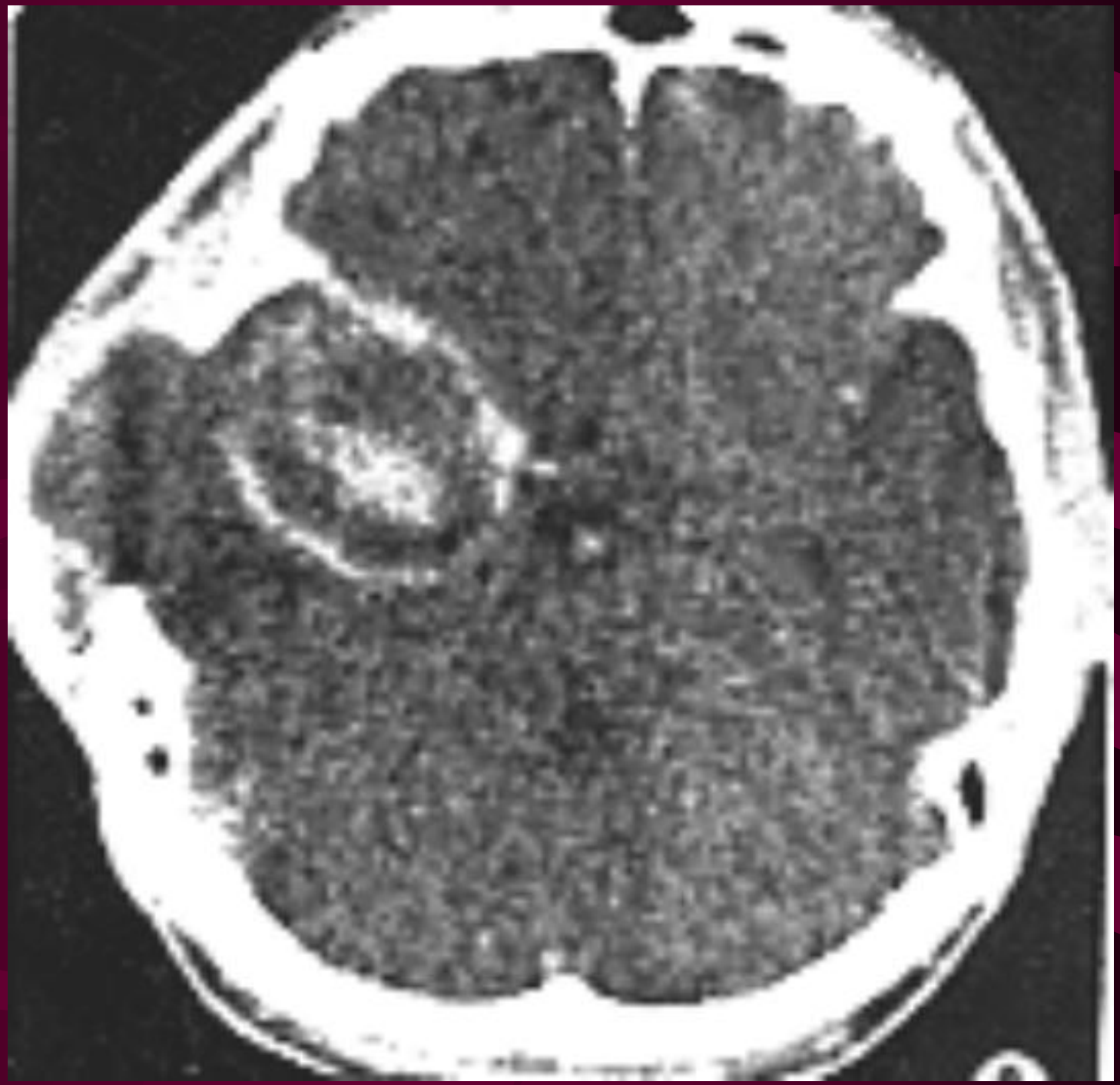
增强：周围和中心强化

中间血栓无强化

颅内动脉瘤—CT表现

动脉瘤，部分血栓形成。增强后CT扫描显示左基底节区一圆形病灶，呈环状增强，外侧壁明显增强为瘤腔，其内不增强部分为血栓。

颅内动脉瘤－CT表现



颅内动脉瘤—CT表现

4、动脉瘤完全栓塞

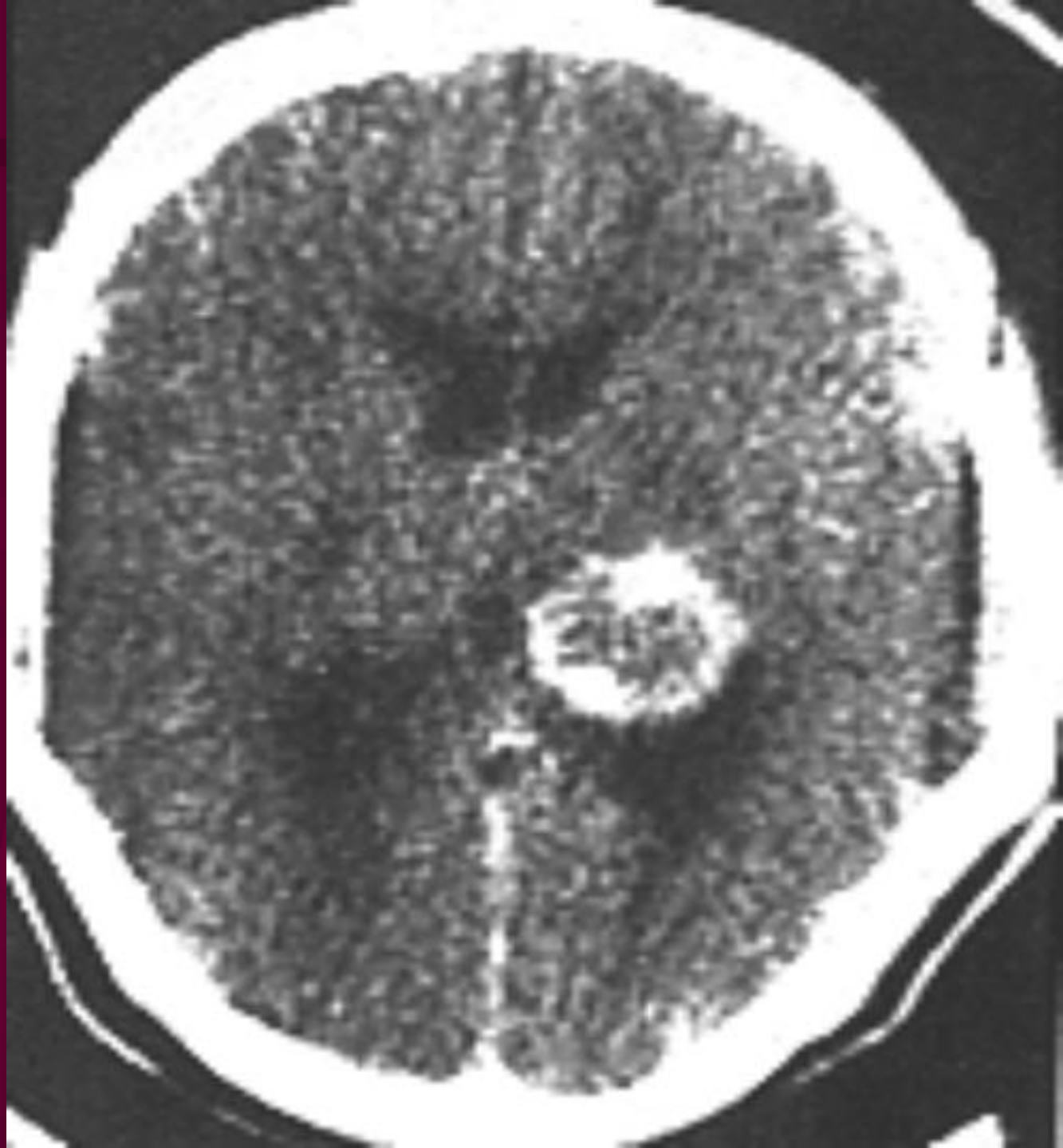
平扫：病灶中心等密度

边缘高密度或钙化

增强：边缘强化

中心不强化

颅内动脉瘤－CT表现



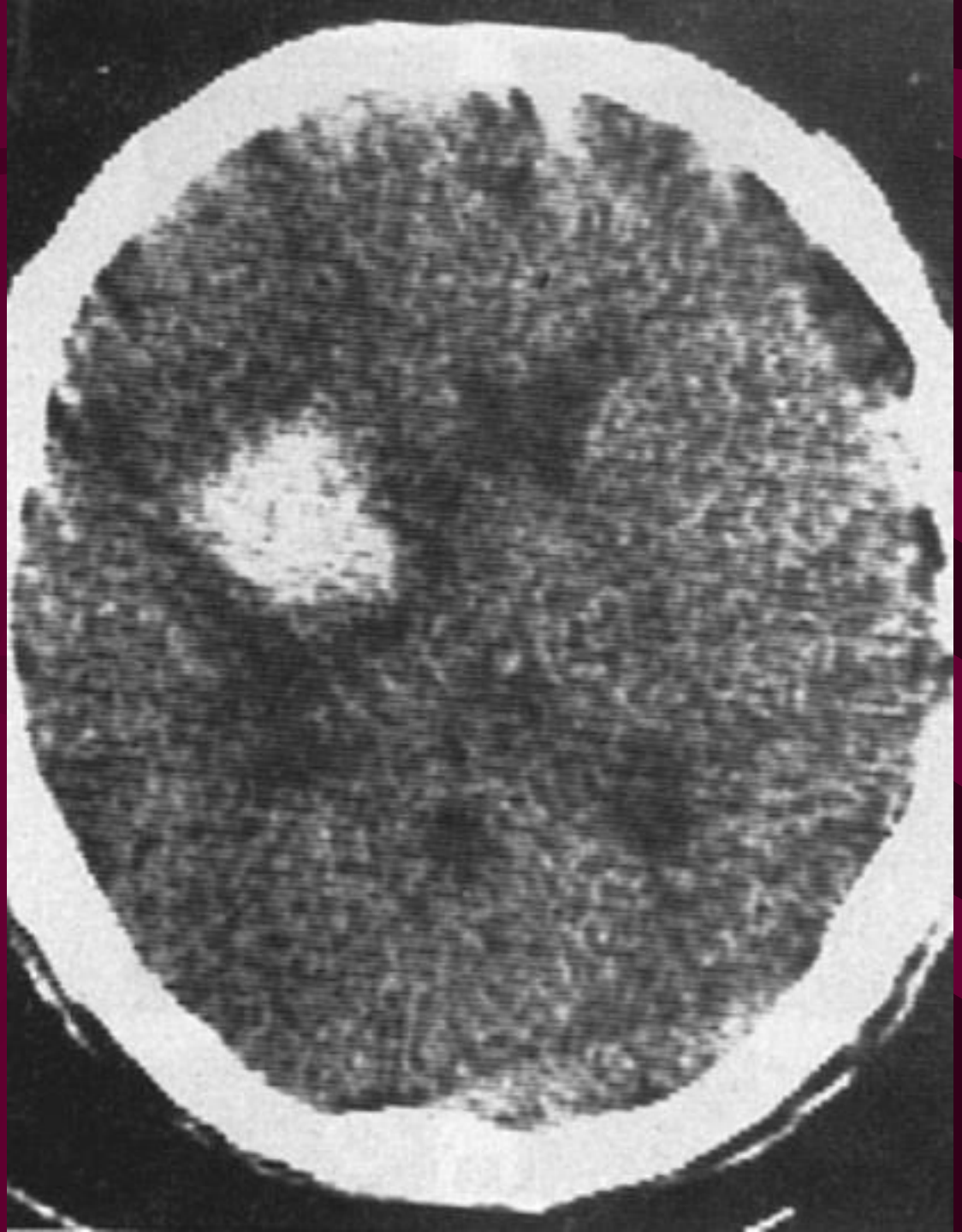
颅内动脉瘤—CT表现

6、动脉瘤破裂

CT不能显示瘤体

CT可显示动脉瘤破裂所致的脑出血、蛛网膜下腔出血、脑积水、脑水肿、脑梗塞、脑疝

颅内动脉瘤－CT表现



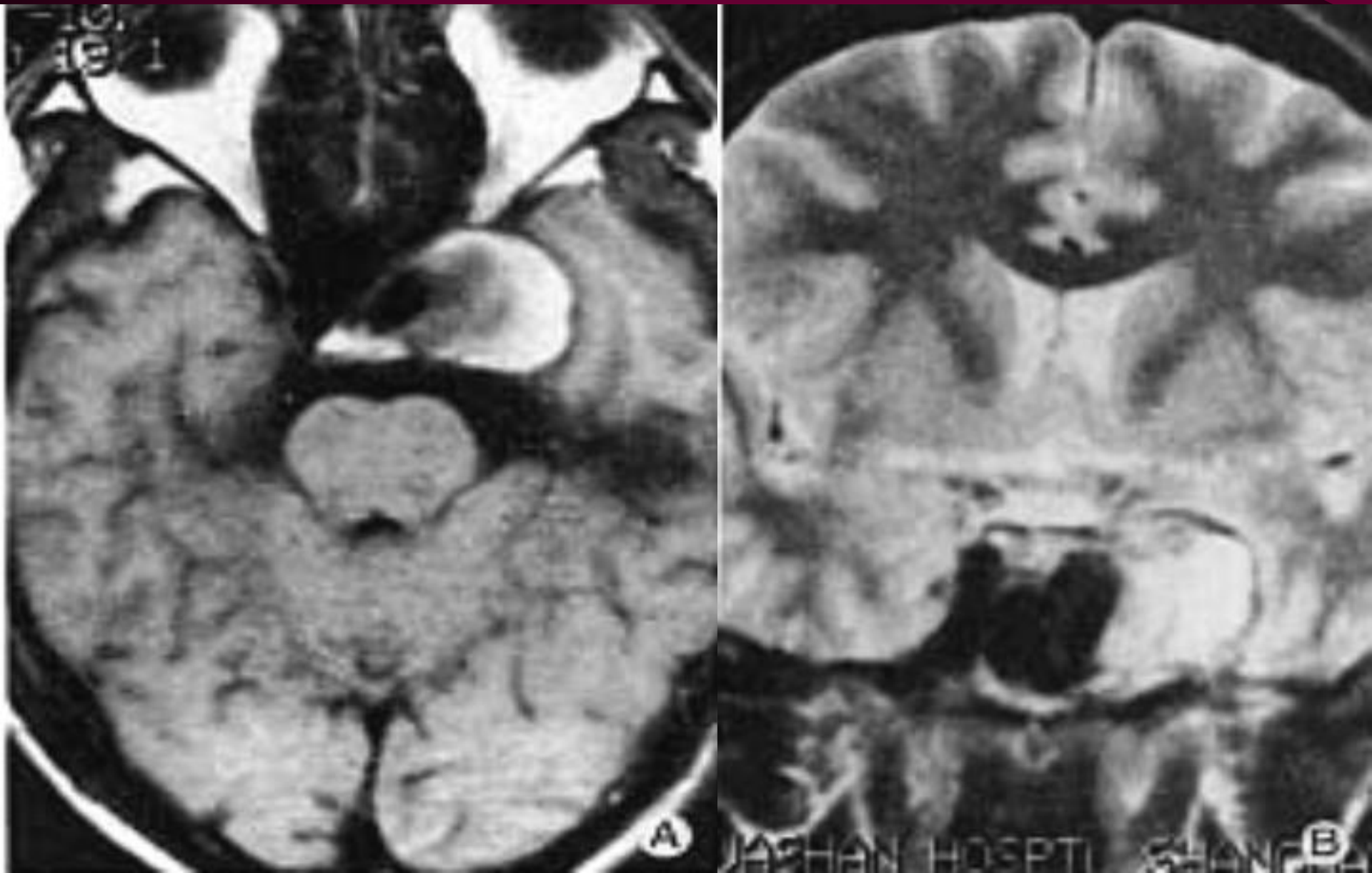
颅内动脉瘤—MRI表现

1、T1W和T2W 流空低信号

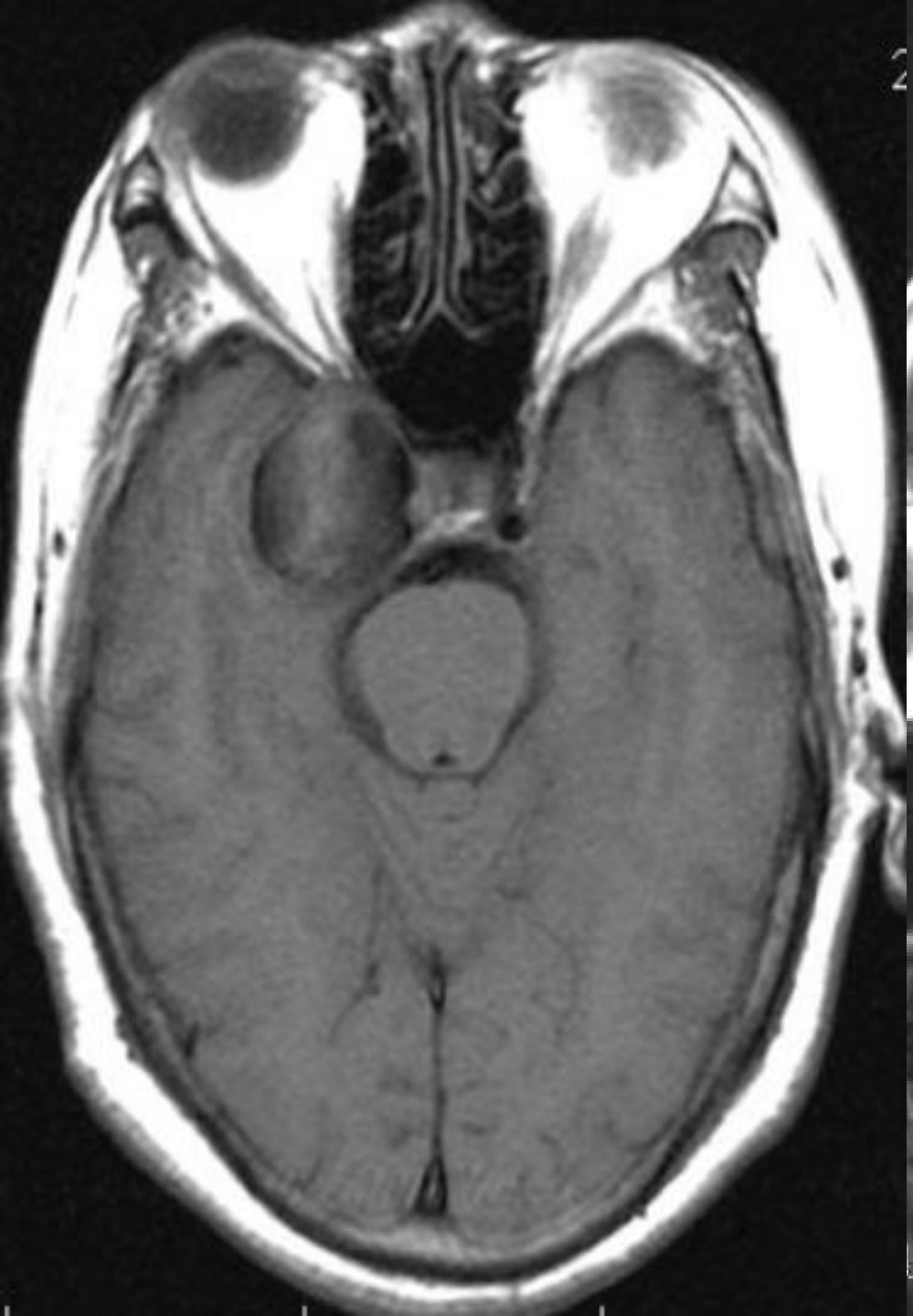
2、血栓形成后，中央为流空信号，
血栓T1W和T2W为高信号

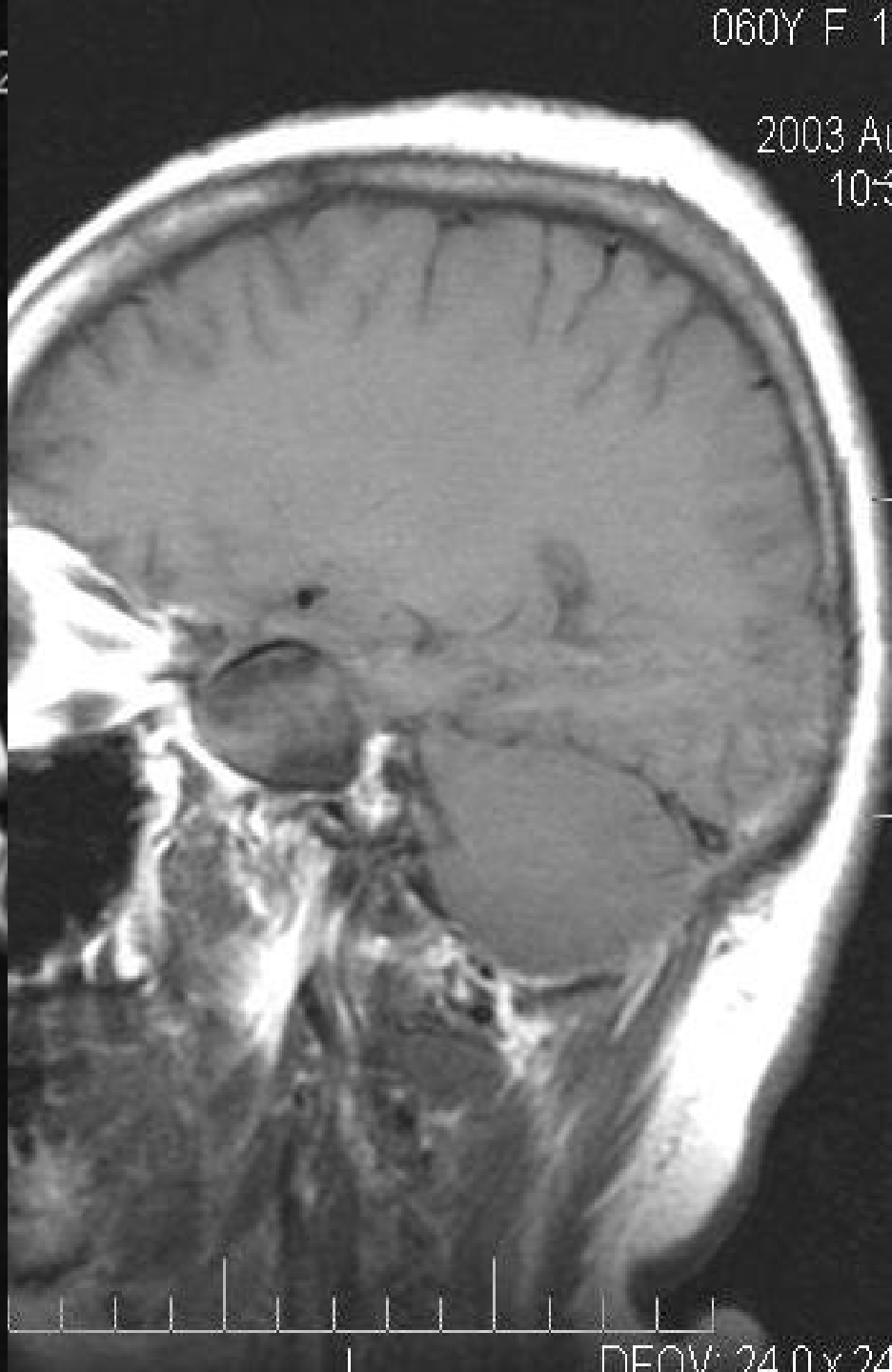
3、较大动脉瘤内的信号不均匀。

颅内动脉瘤—MRI表现



颅内动脉瘤—MRI表现

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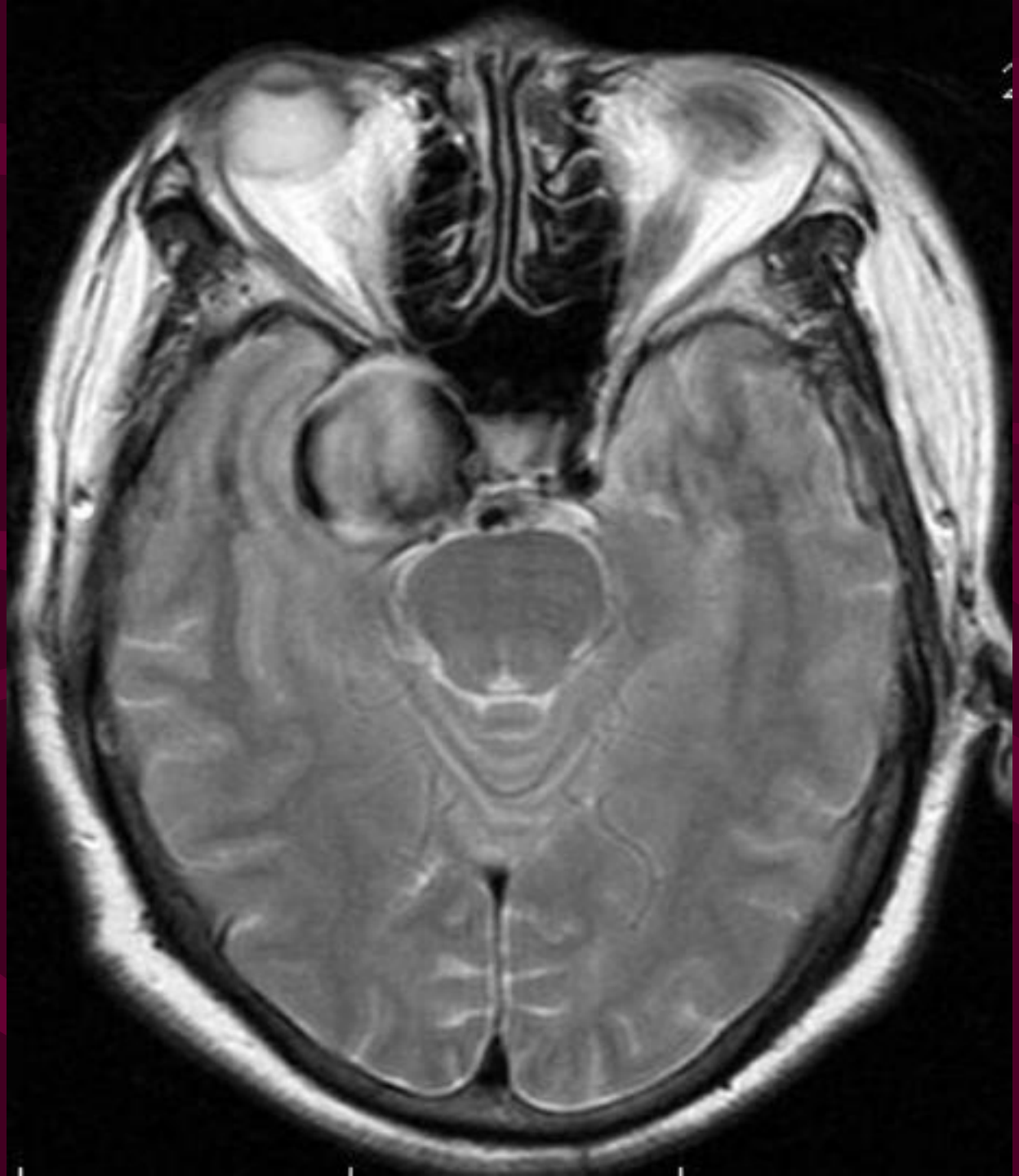

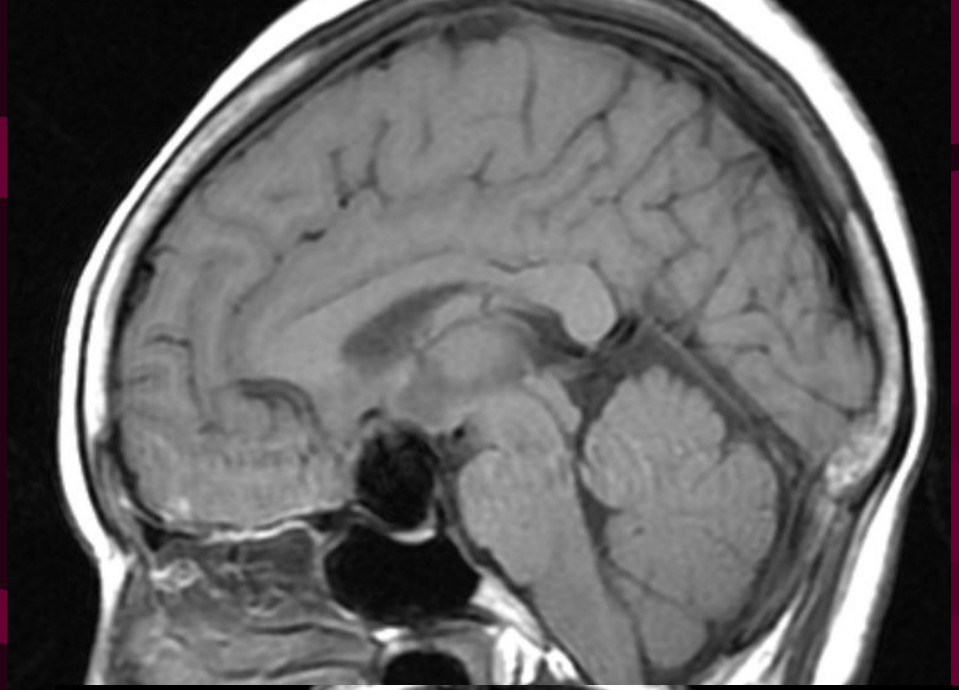
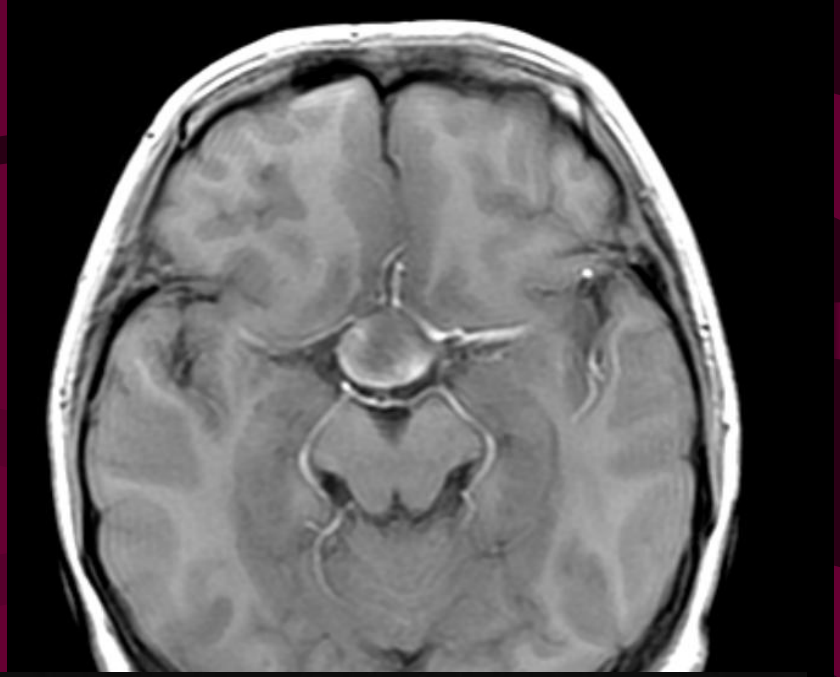
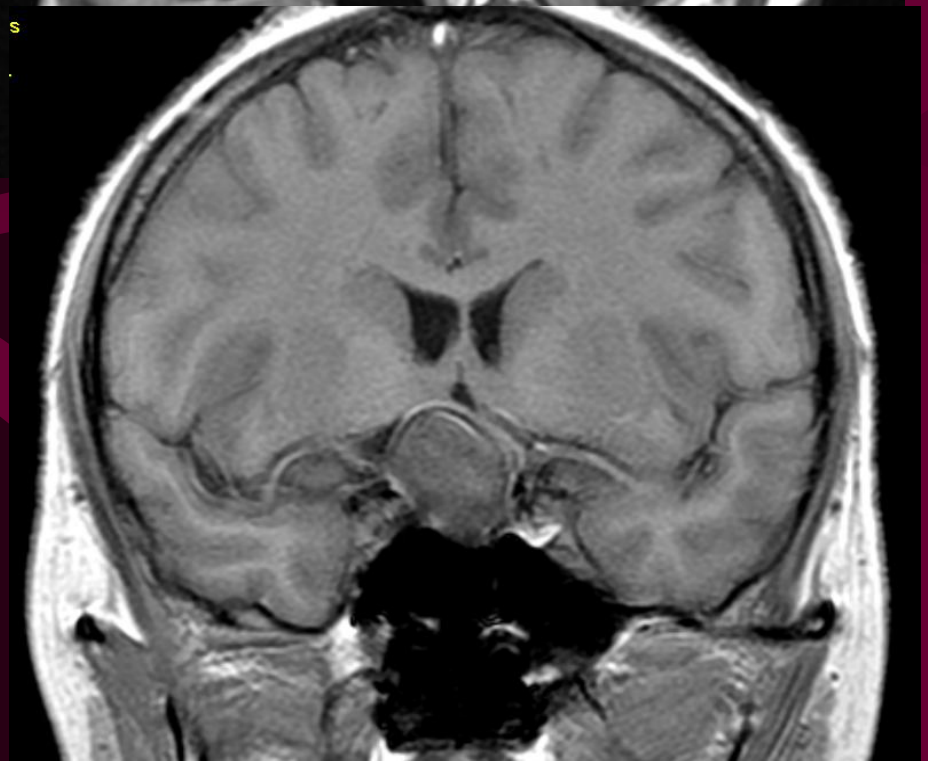
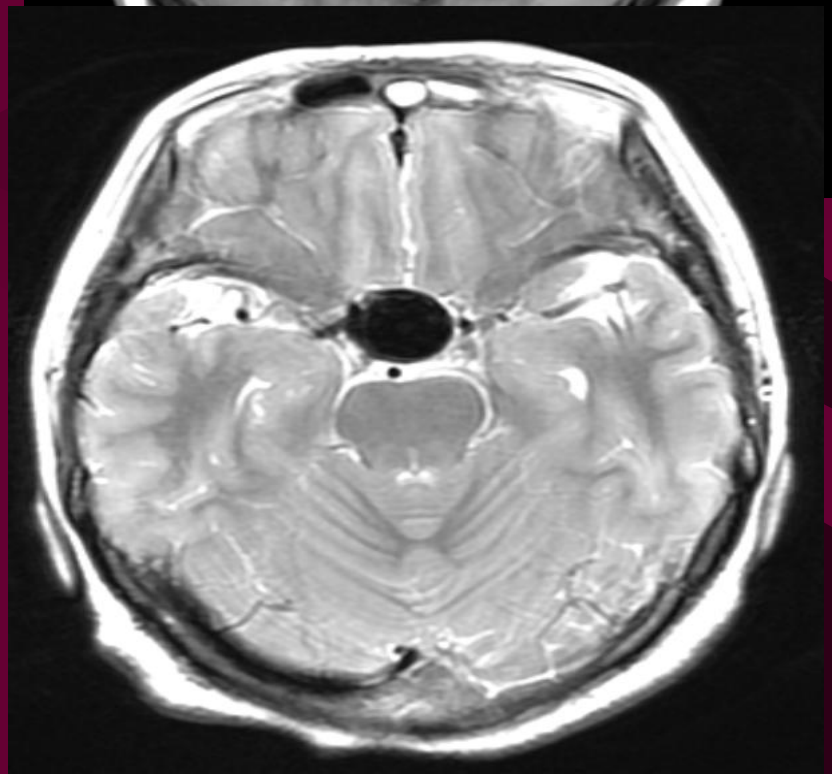

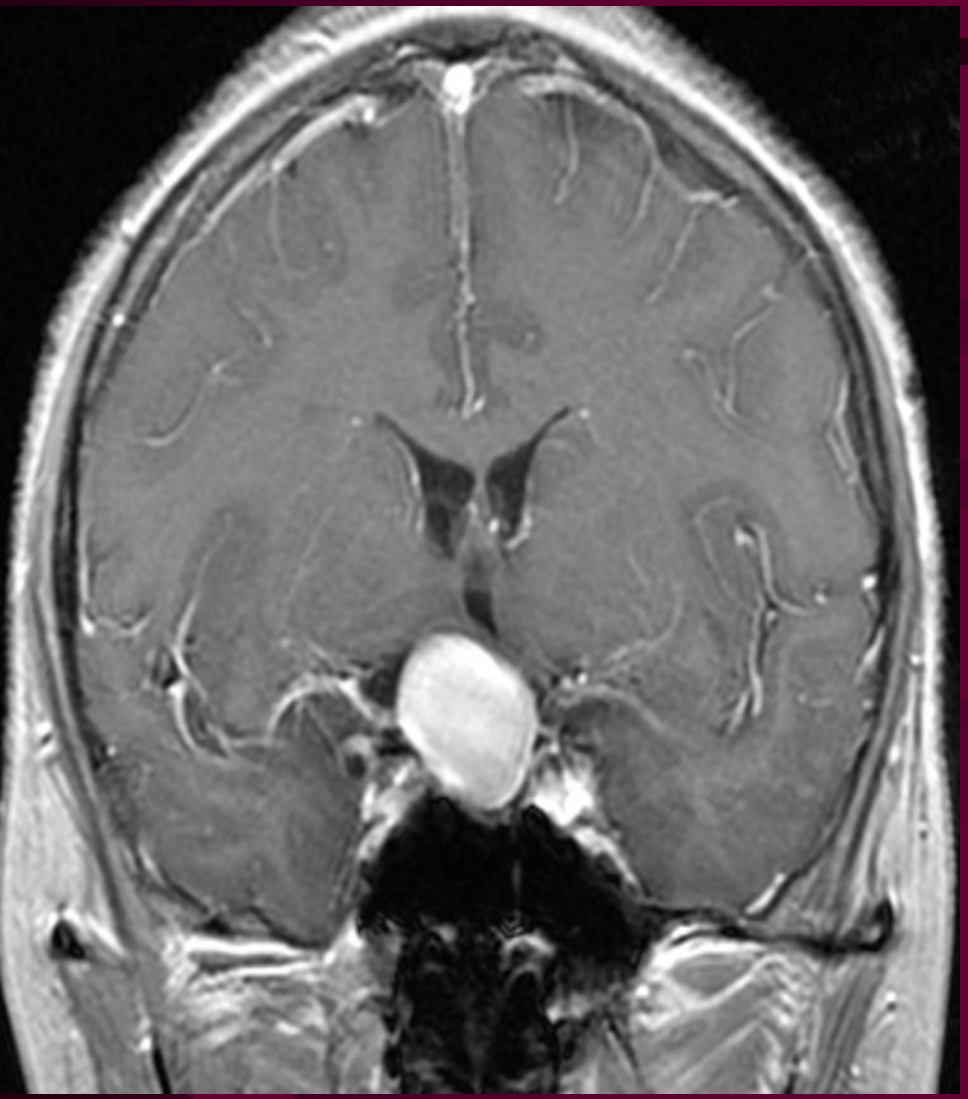

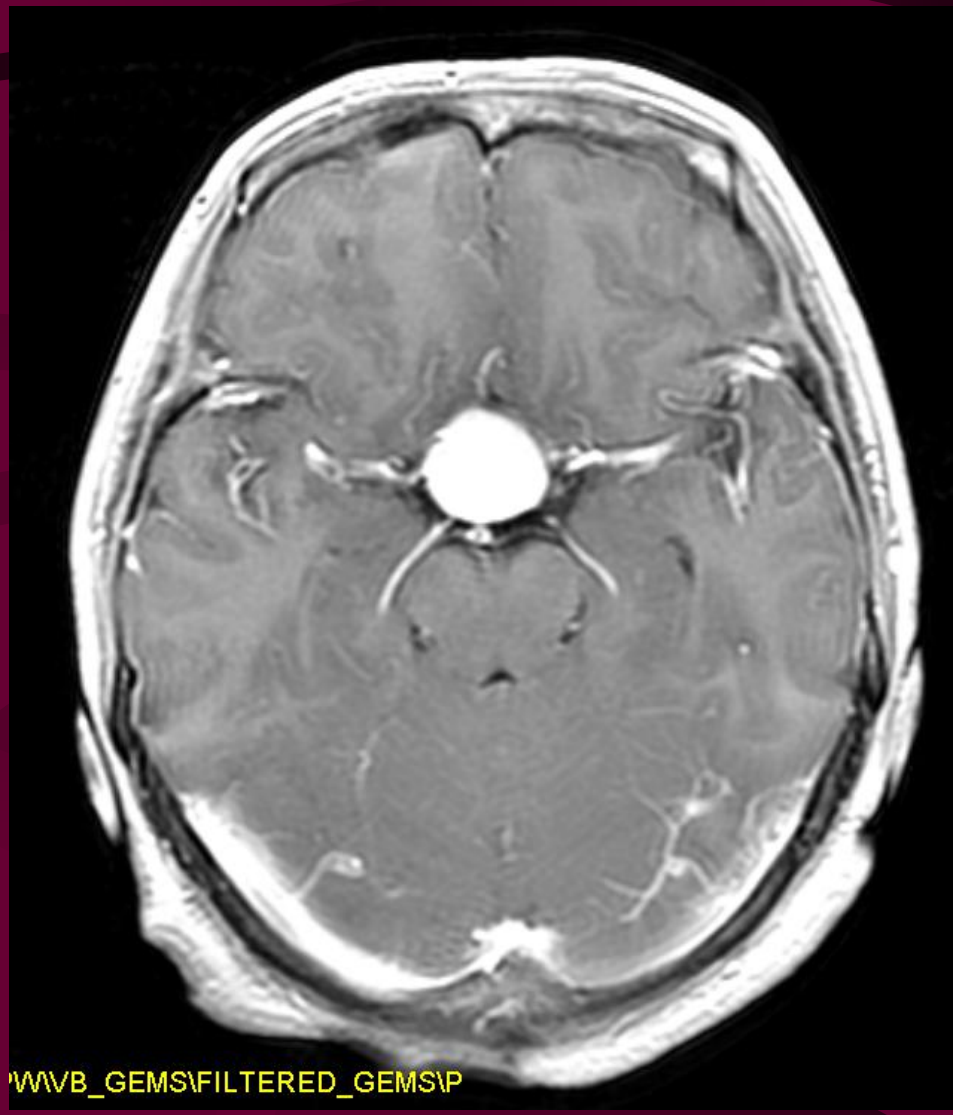
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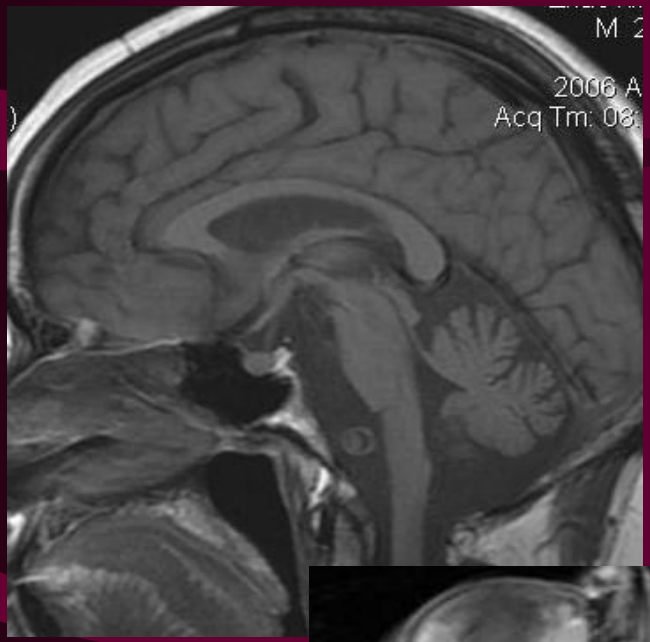
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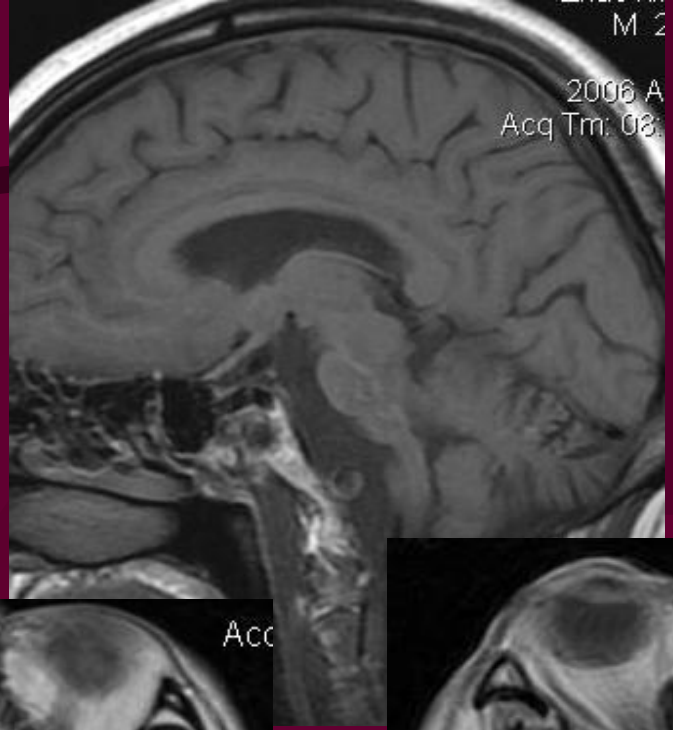
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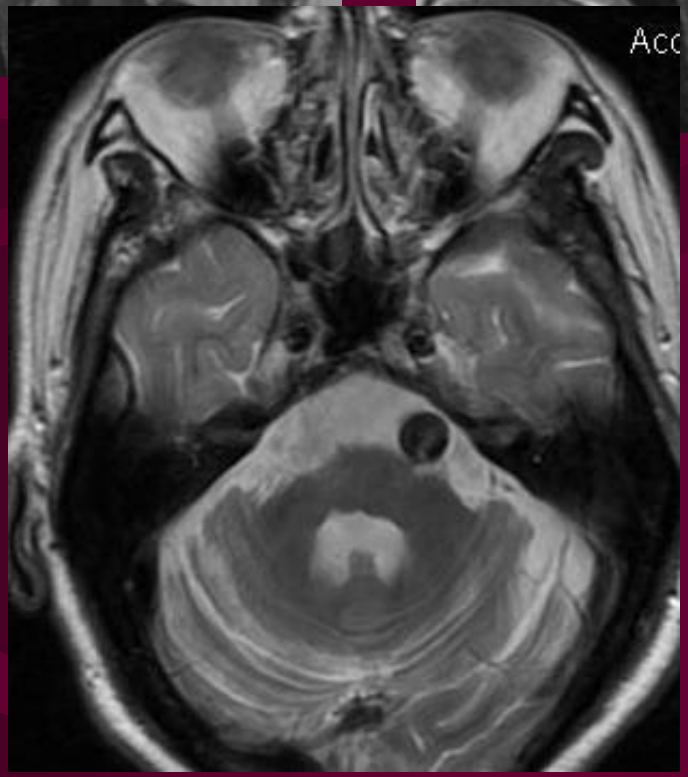
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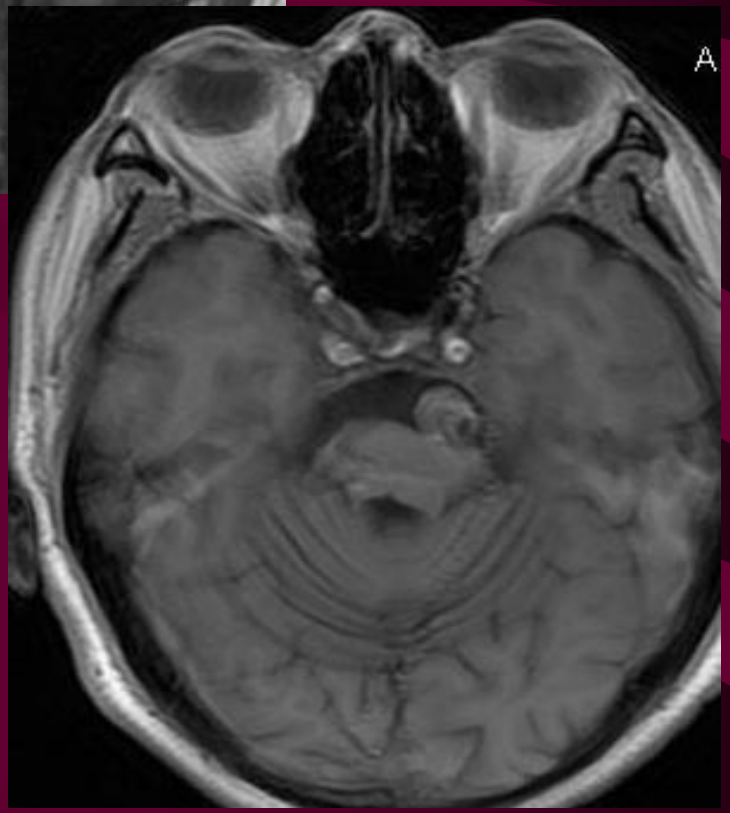
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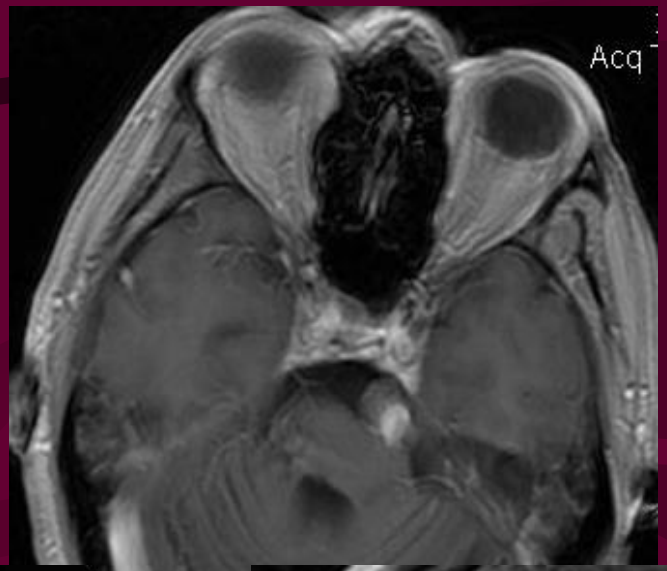
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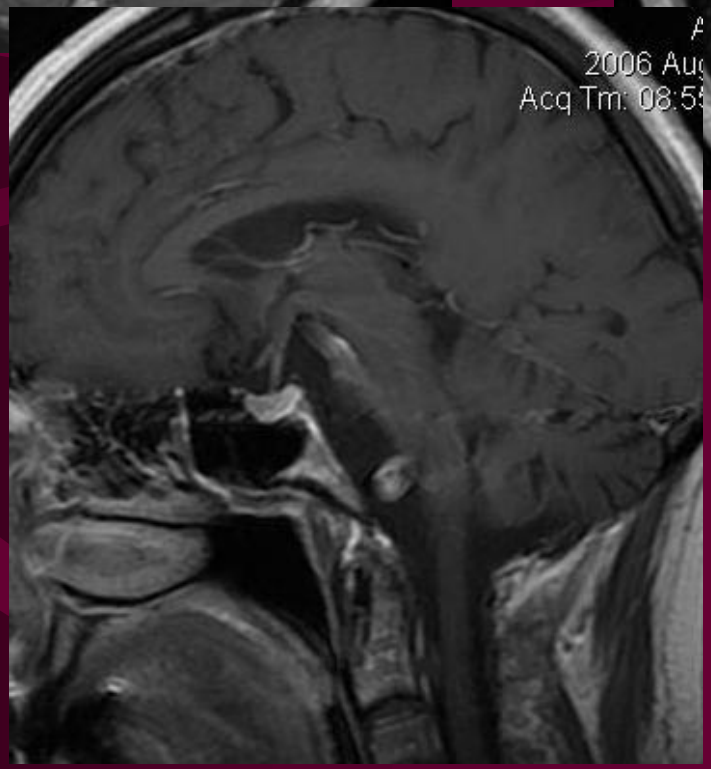
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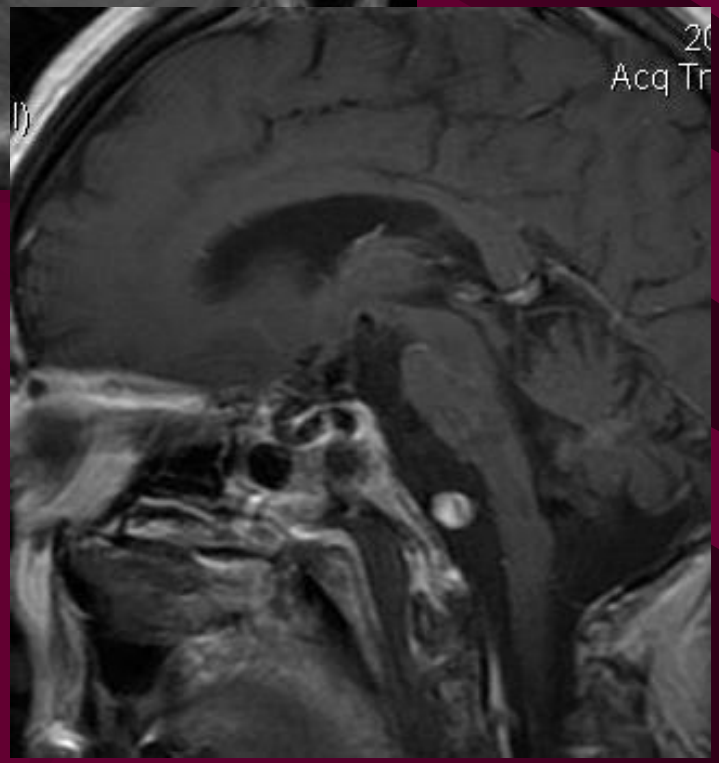
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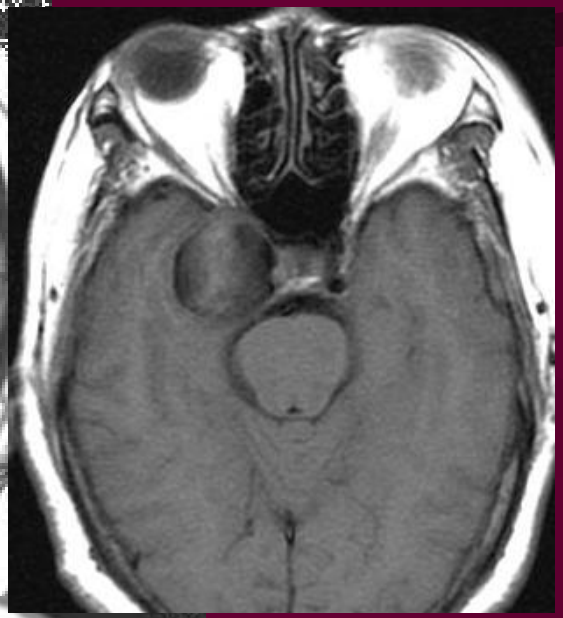


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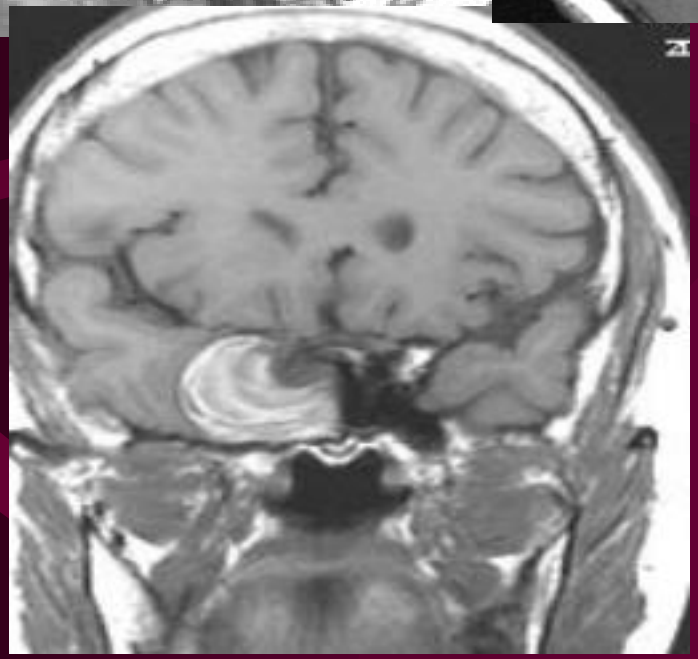

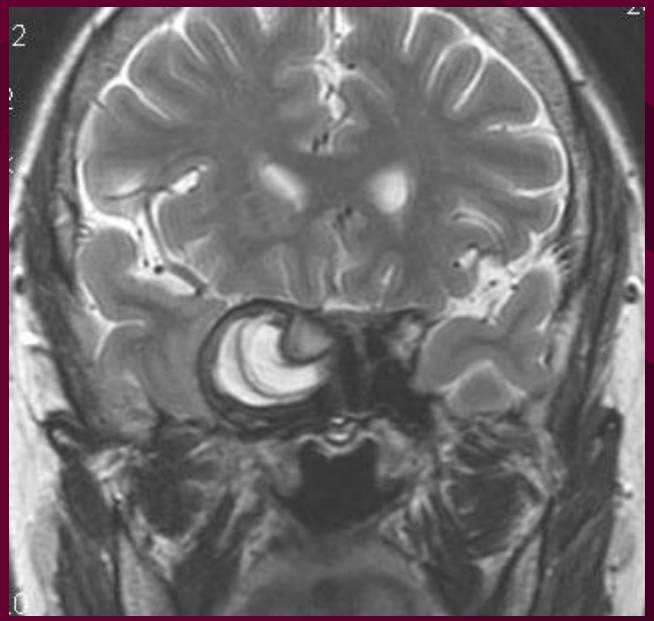

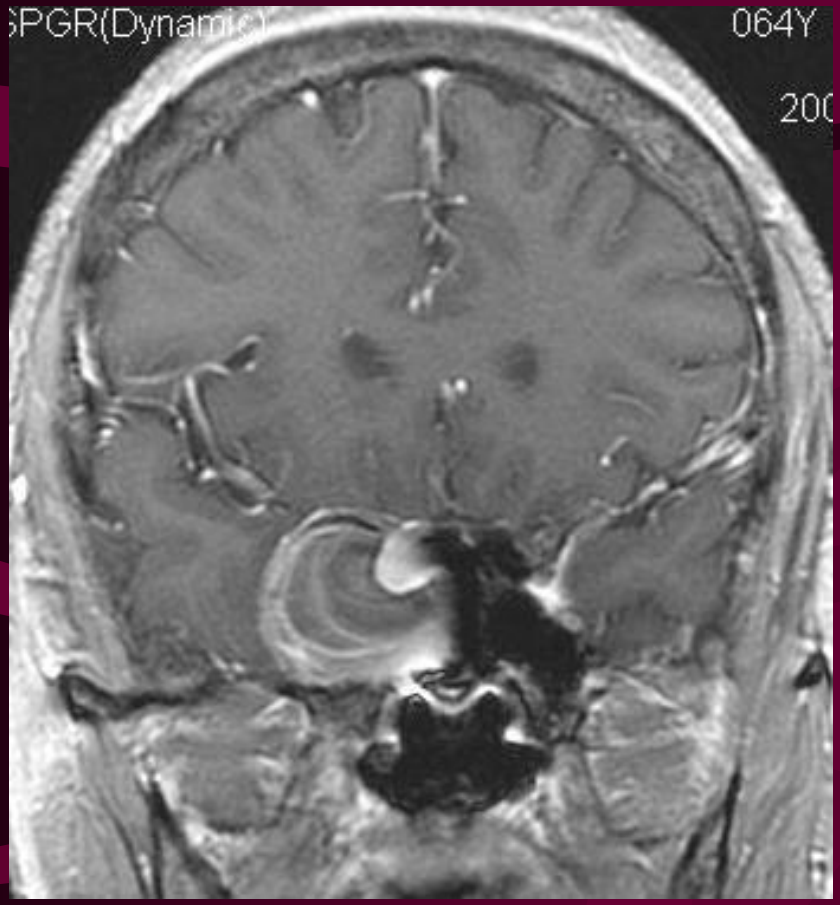
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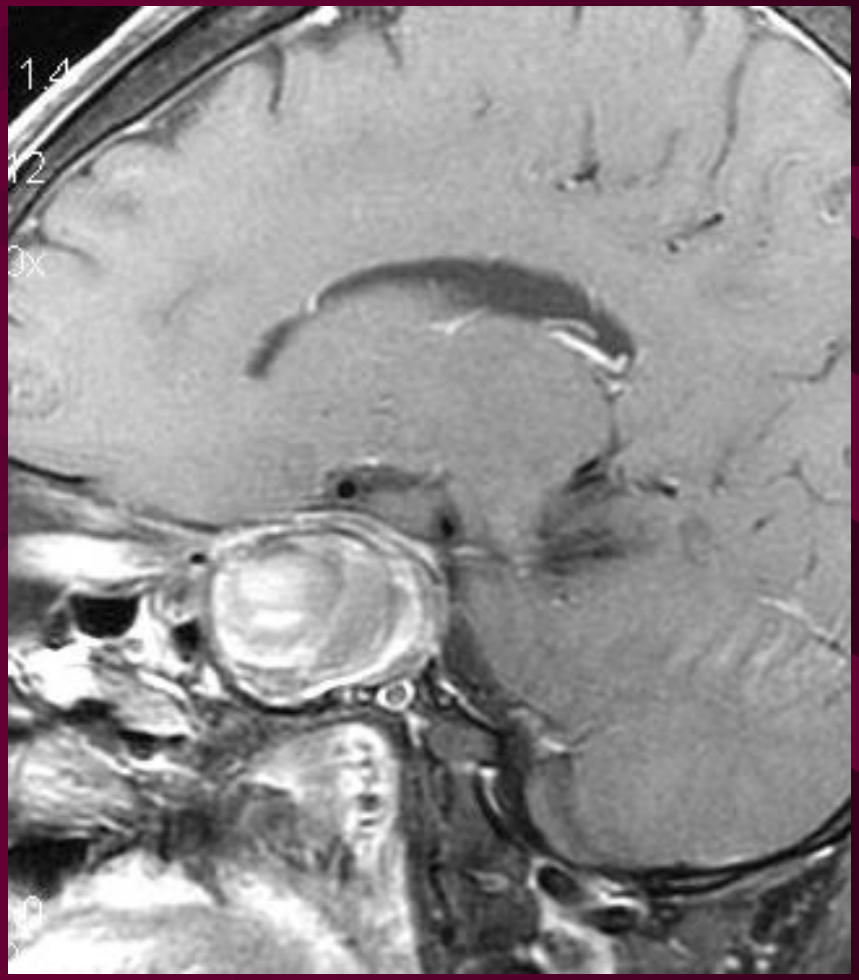


颅内动静脉畸形影像学

颅内动静脉血管畸形

Intracranial arteriovenous malformation AVM

颅内血管畸形是颅内血管床的发育畸形

表现为颅内某一区域血管的异常增多

发生于任何年龄，72％40岁前起病

蛛网膜下腔出血中占8.6％。

AVM-病理

AVM可发生于颅内任何部位。常见于大脑中动脉分布区的脑皮质，也可见于侧脑室、硬脑膜、软脑膜、脑干、小脑幕上占70～93％

畸形血管呈粗细不等的团块状，其中有血管极度扩张、扭曲，管壁薄，有时可见动脉与静脉直接相通。

AVM—CT表现

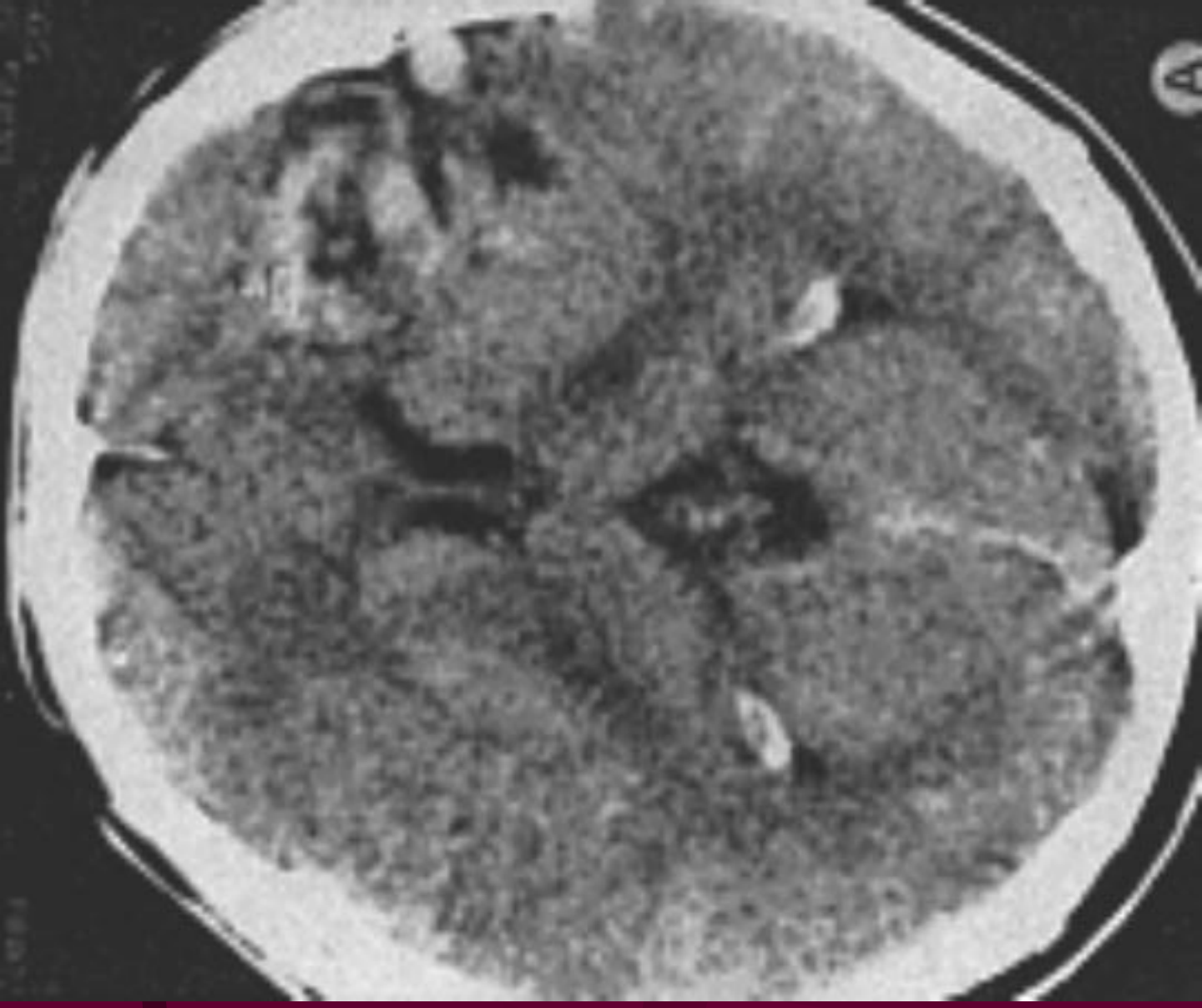
1、平扫：高、低、等混杂密度

病灶形态不规则

团块状，或点、线状

边缘不清

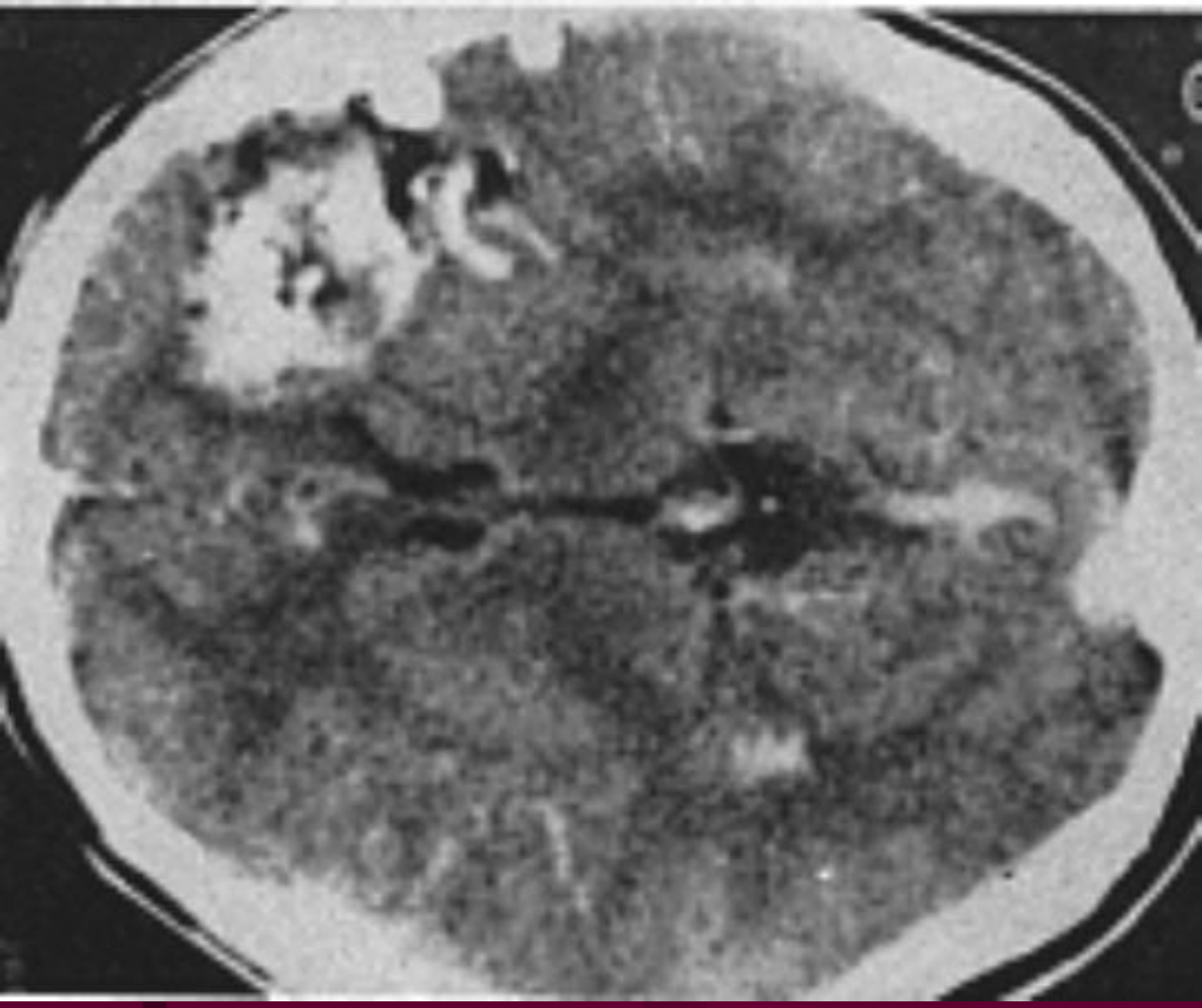
周围可有局限性脑萎缩



AVM－CT表现

AVM－CT表现

2、增强：团块状强化。有时可见迂曲的血管影，其周围可见到供血动脉和引流静脉。



AVM－CT表现

AVM—CT表现

3、50%的病例伴有出血

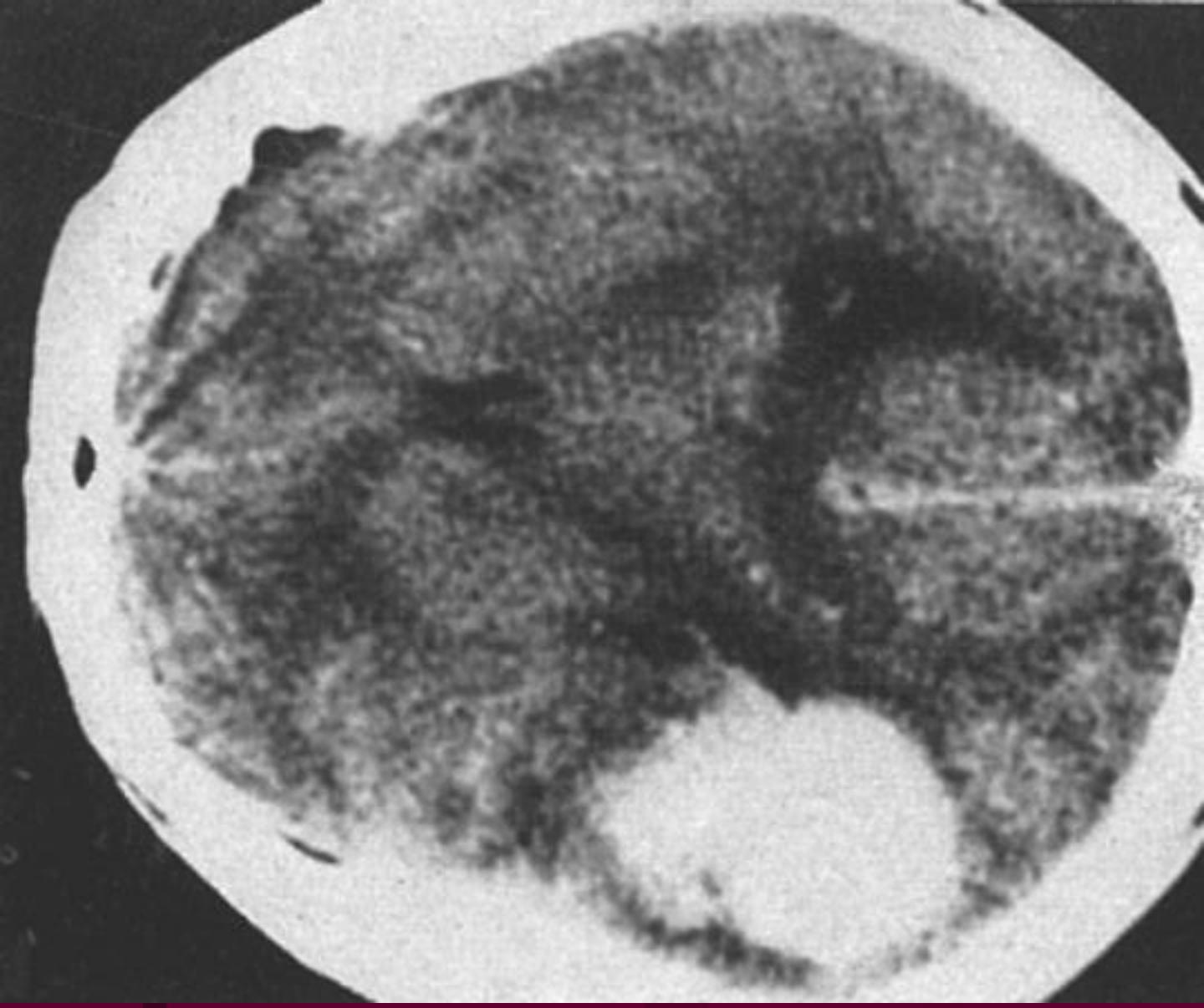
发生于脑实质或

蛛网膜下腔

脑室系统

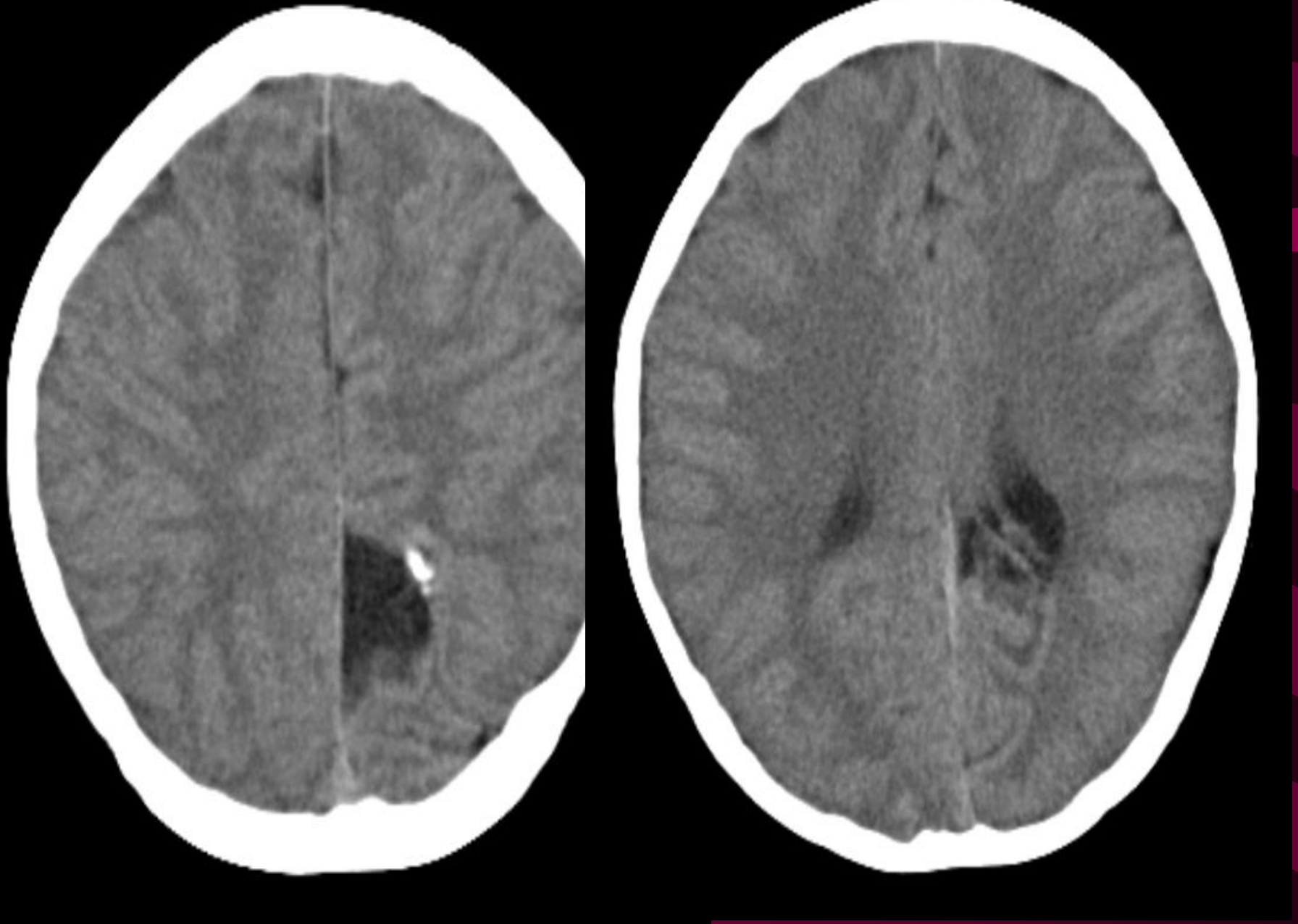
CT可显示出血，增强后部分血

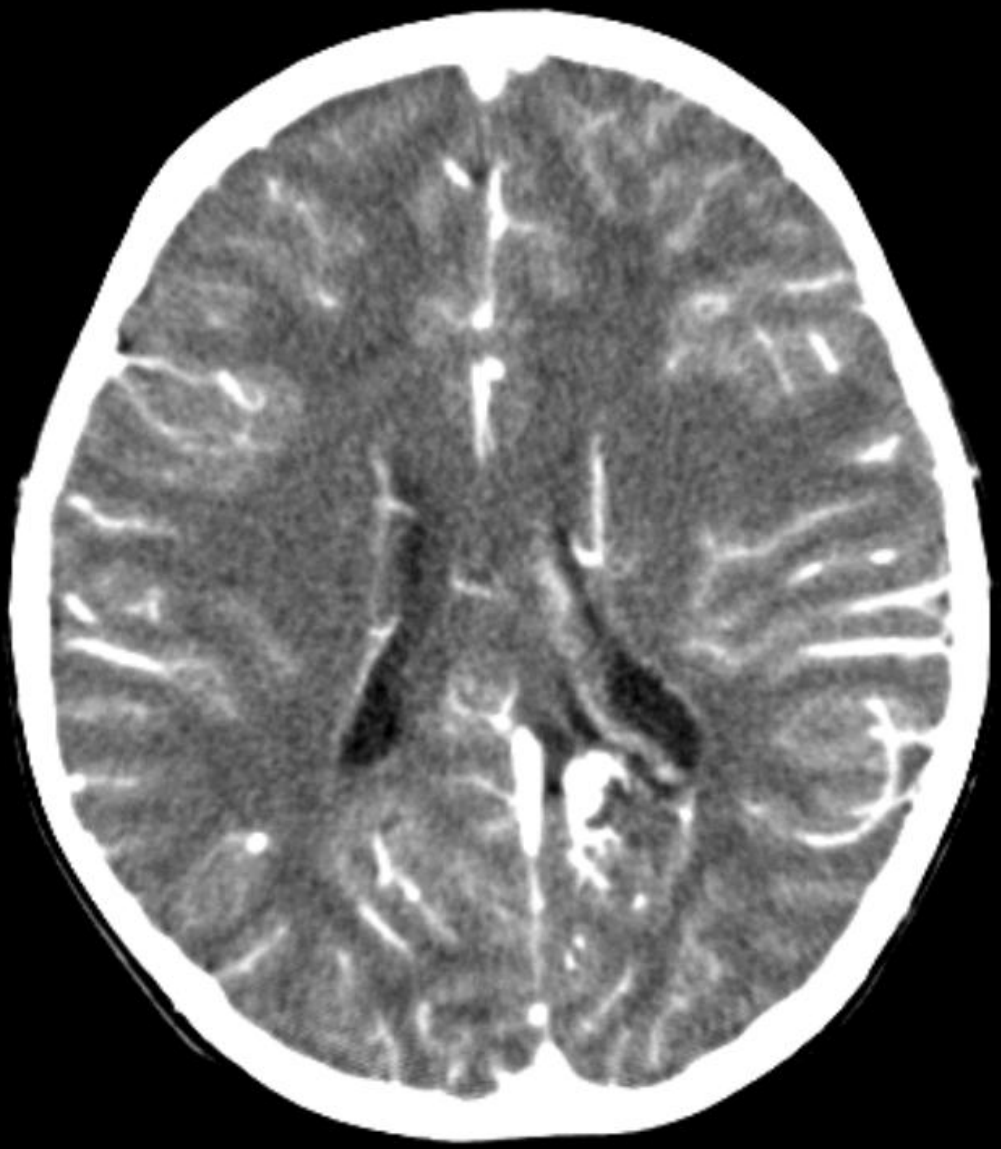
肿边缘可见畸形迂曲的血管影

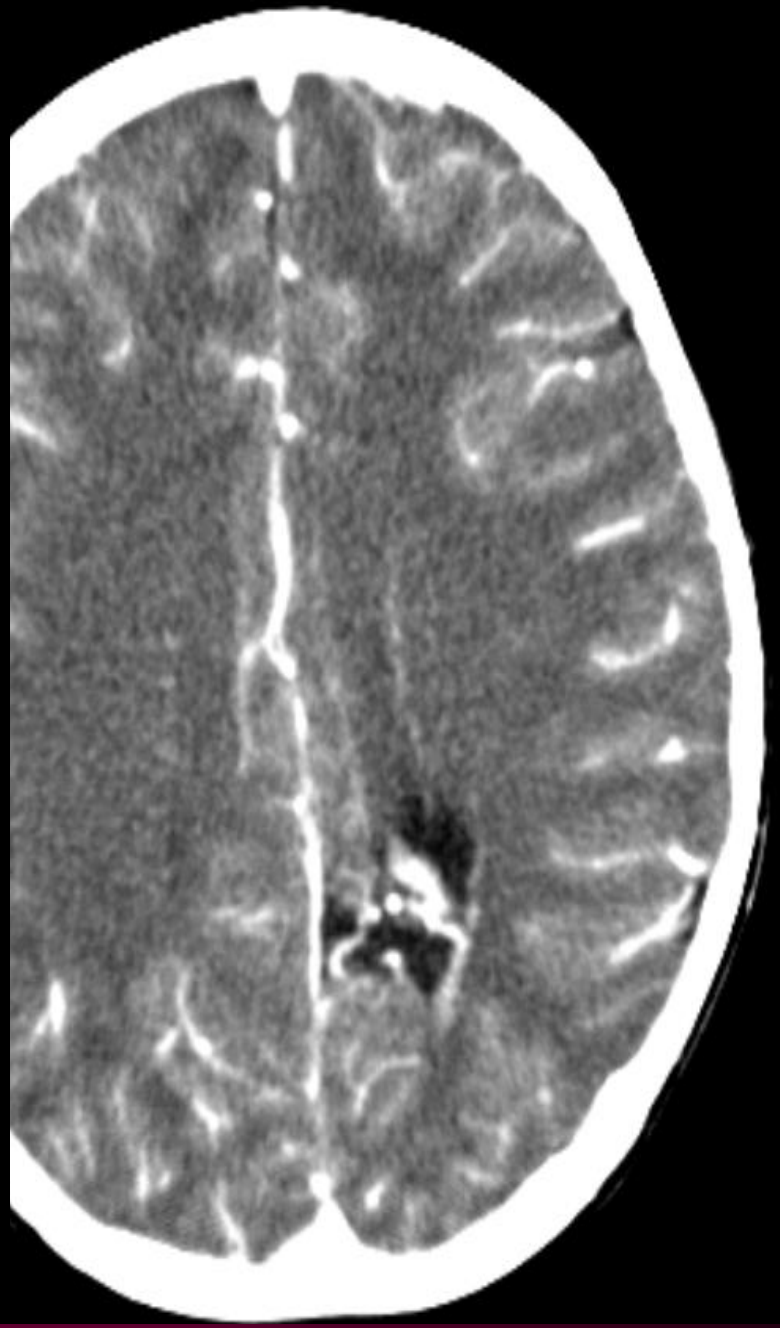


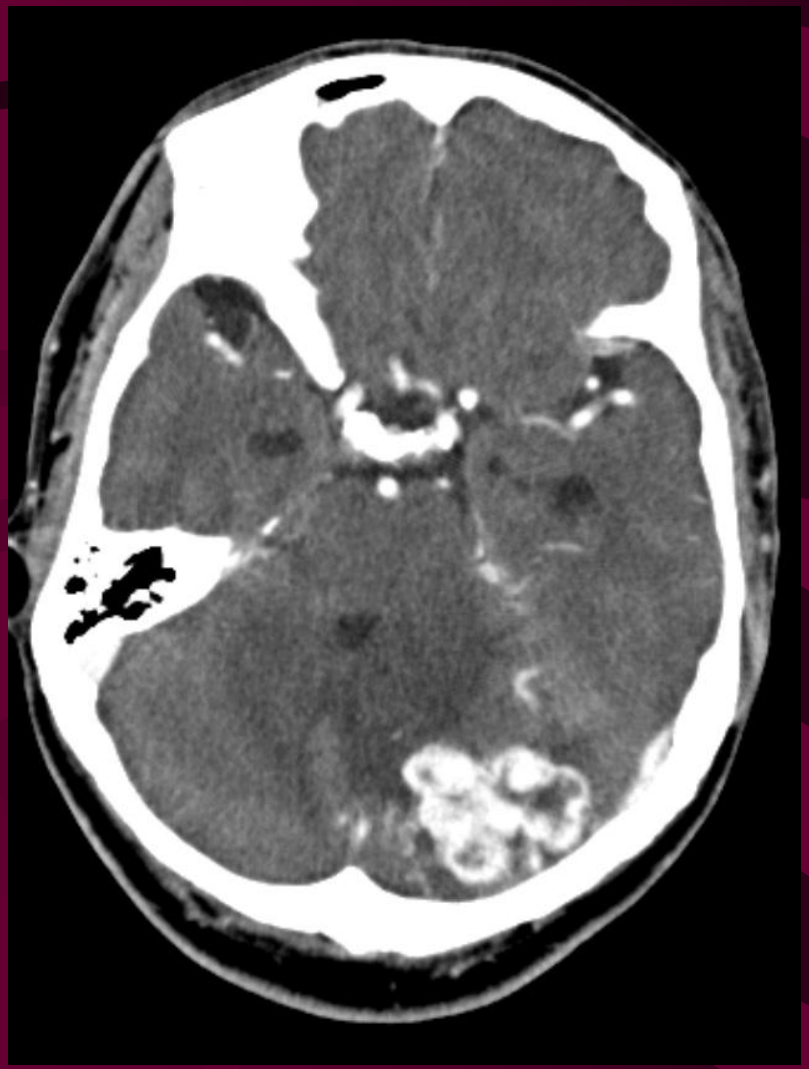
AVM－CT表现

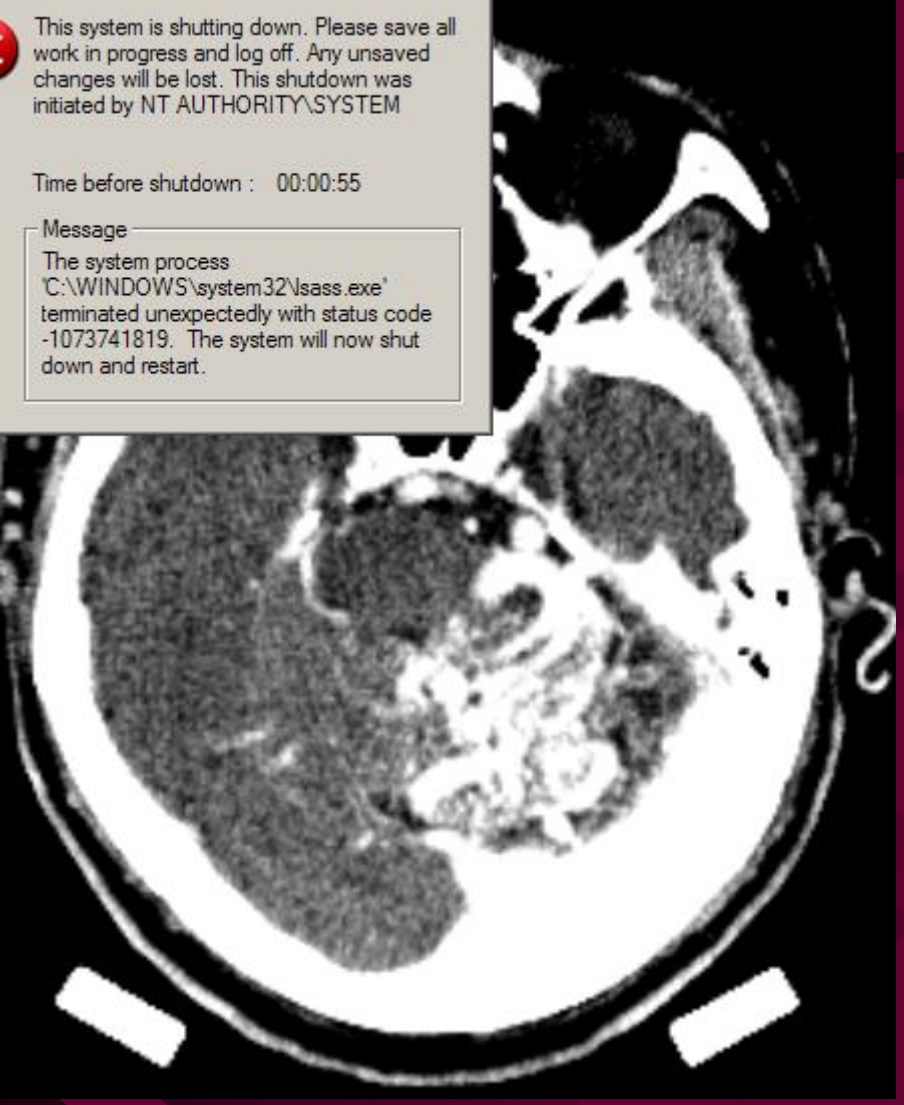
AVM—CT表现

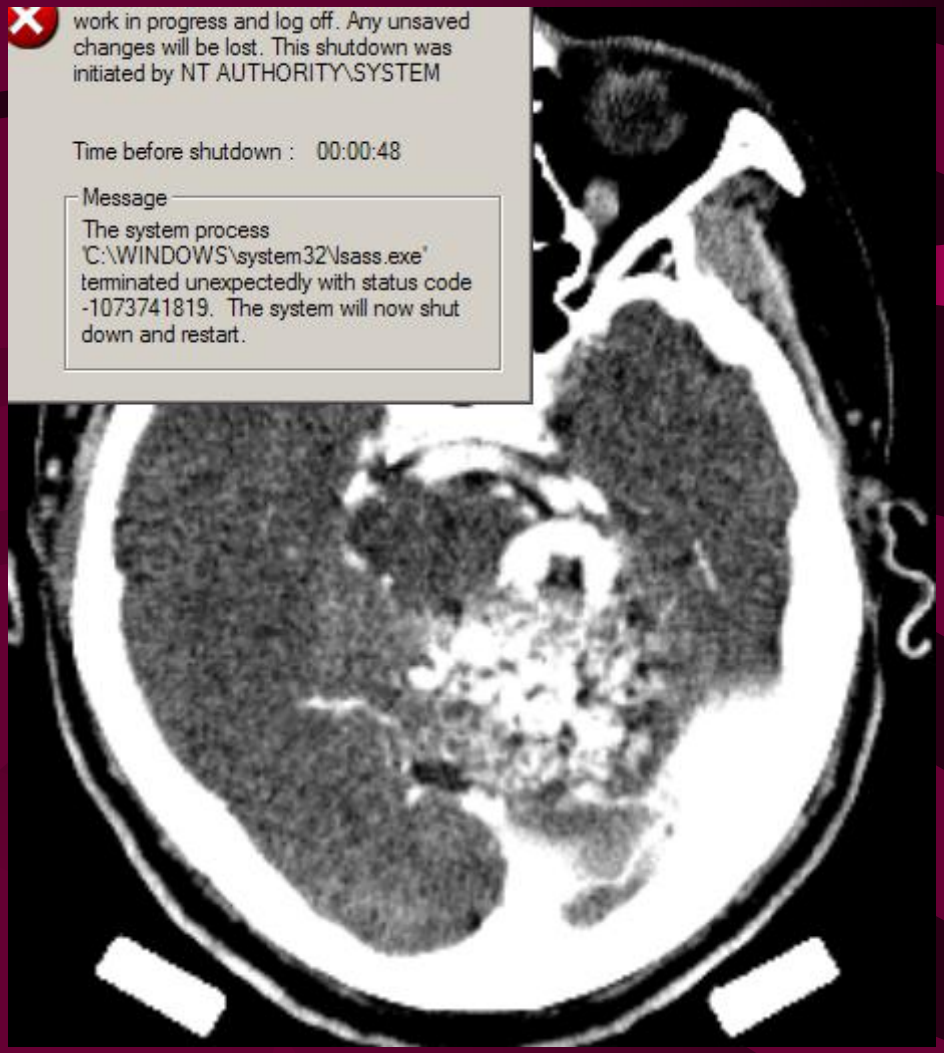









This system is shutting down. Please save all work in progress and log off. Any unsaved changes will be lost. This shutdown was initiated by NT AUTHORITY\SYSTEM
Time before shutdown : 00:00:55
Message
The system process 'C:\WINDOWS\system32\lsass.exe' terminated unexpectedly with status code -1073741819. The system will now shut down and restart.


work in progress and log off. Any unsaved changes will be lost. This shutdown was initiated by NT AUTHORITY\SYSTEM
Time before shutdown : 00:00:48
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The system process 'C:\WINDOWS\system32\lsass.exe' terminated unexpectedly with status code -1073741819. The system will now shut down and restart.


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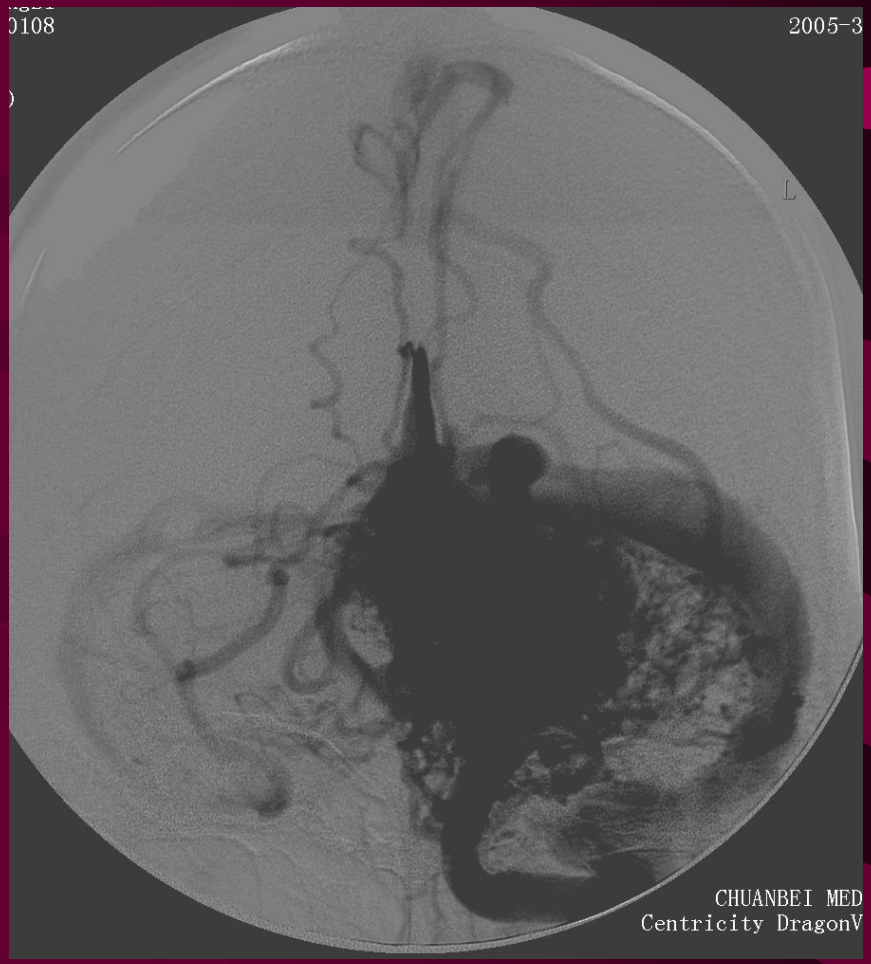
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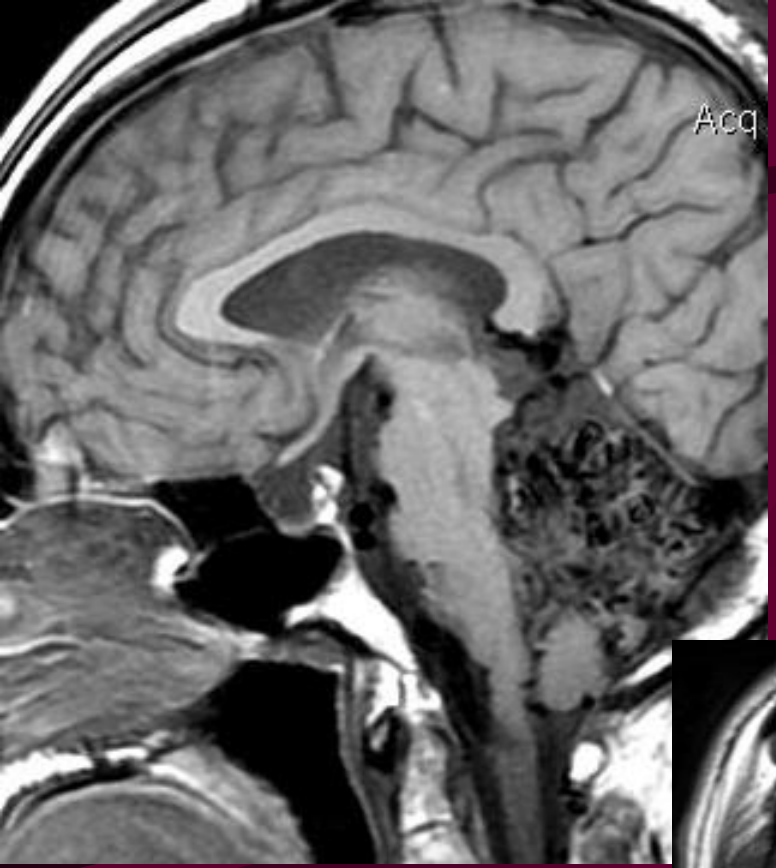
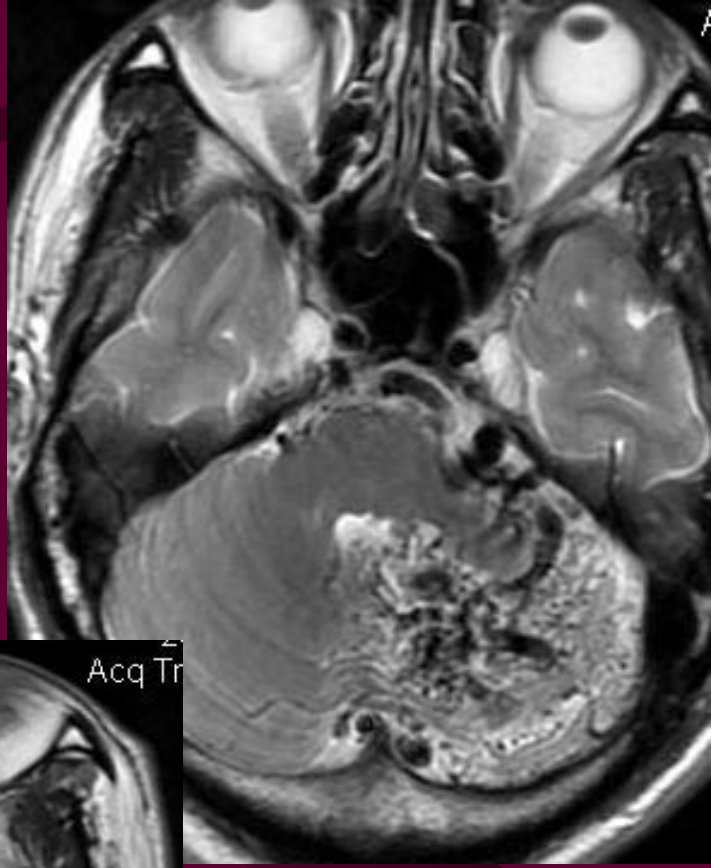
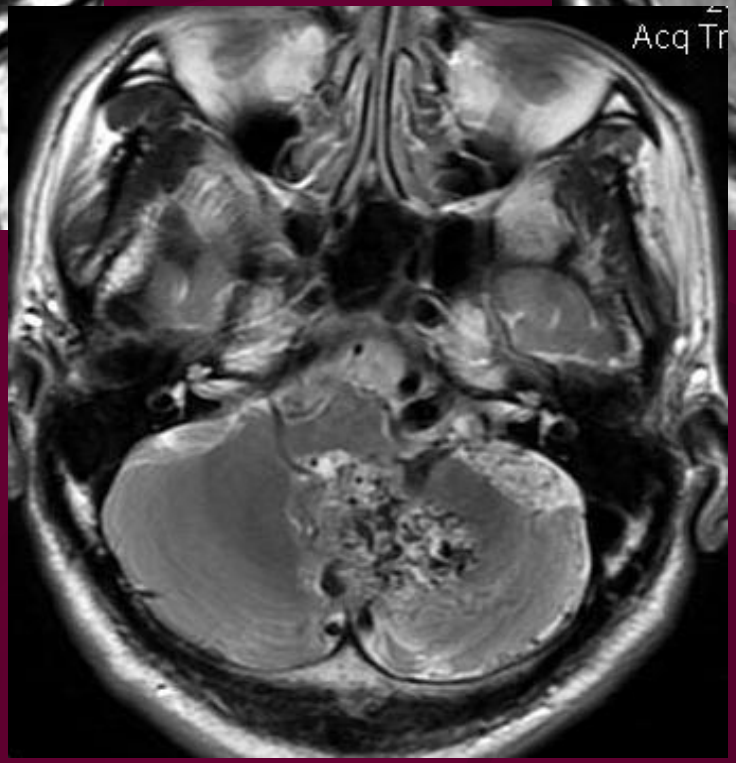
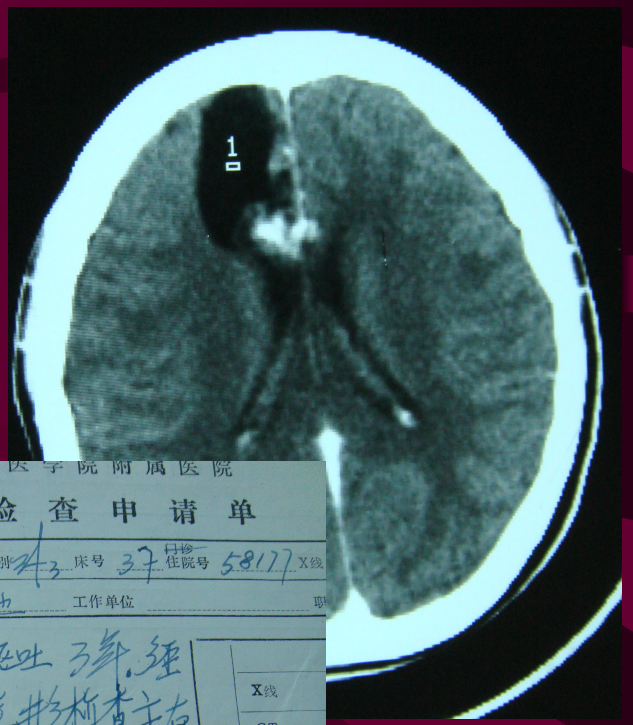
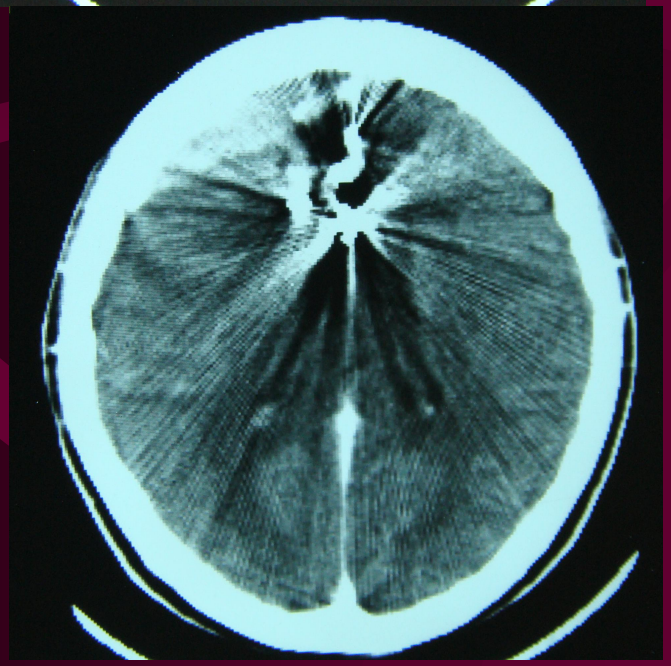






AVM





川北医学院附属医院

拼音 FAN-SHU-LAN　CT 检查申请单

姓名 范素兰　男 女　年龄 23　科别 外3　床号 37　门诊 住院号 58177　X线

CT号 7852(69)　住址 四川南充池　工作单位

临床症状和体征：反复头痛呕吐3年，经CT和血管造影检查右额深部血管畸形，现已手术切除二周，复查。

曾作检查：X线　CT　超声　同位素　脑电图　血管造影　其它

有关检查结果：/

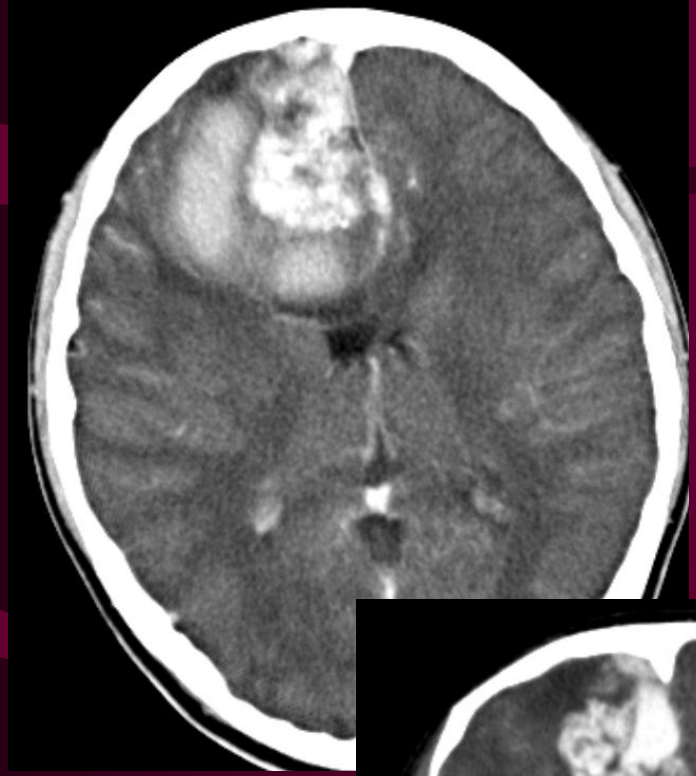
临床诊断：右额深部血管畸形。

检查部位和特殊要求：一次性头颅增强扫描。

有否过敏体质　造影剂过敏

有否其他造影禁忌：心　肝　肾　高血　糖尿　其

是否需要



男,13岁,反复癫痫发作5年,突发头痛3小时。

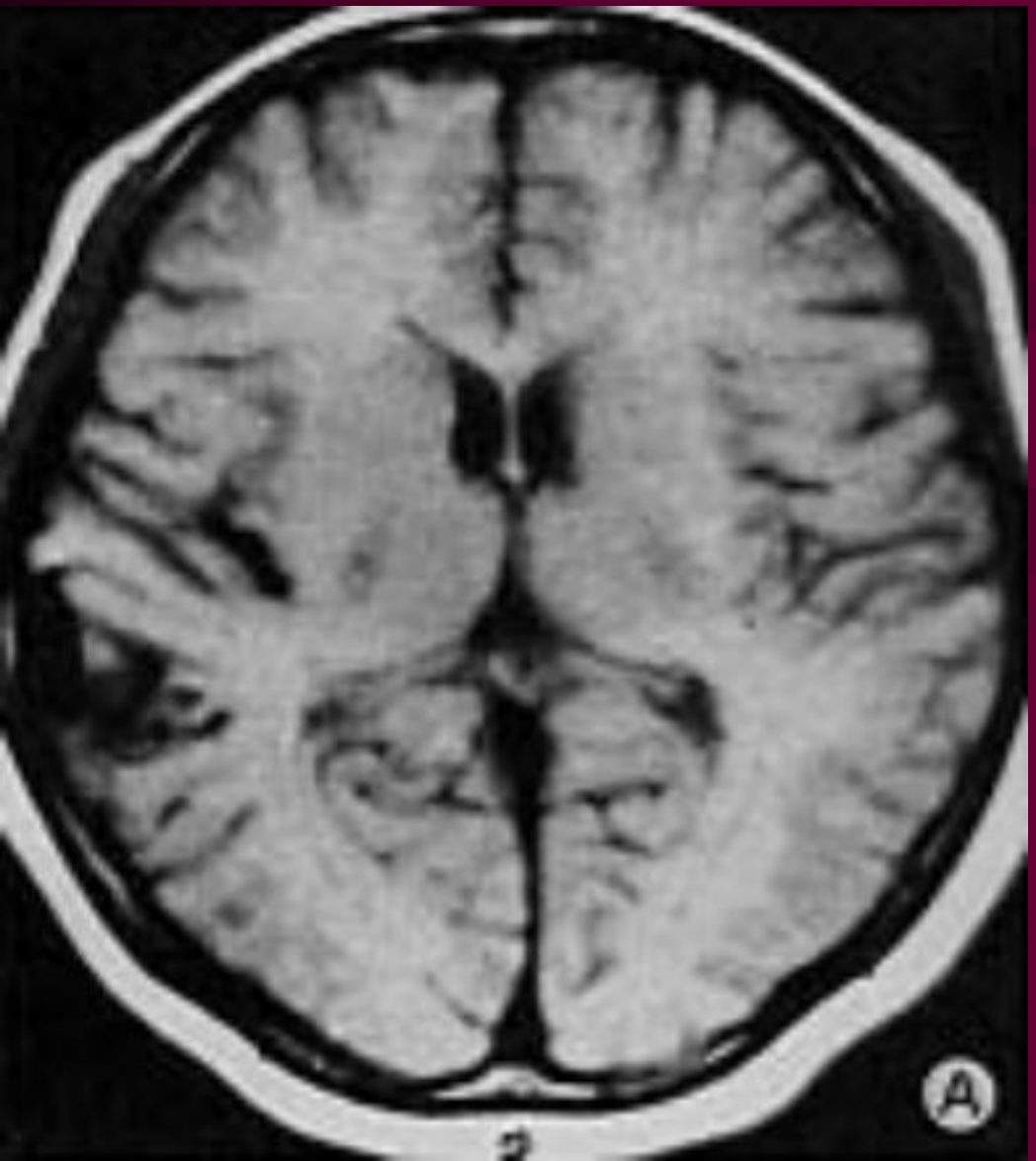
女，52岁，头痛3天多。AVM所致蛛网膜下腔出血。
双侧侧裂池、环池、鞍上池密度增高，边缘模糊。

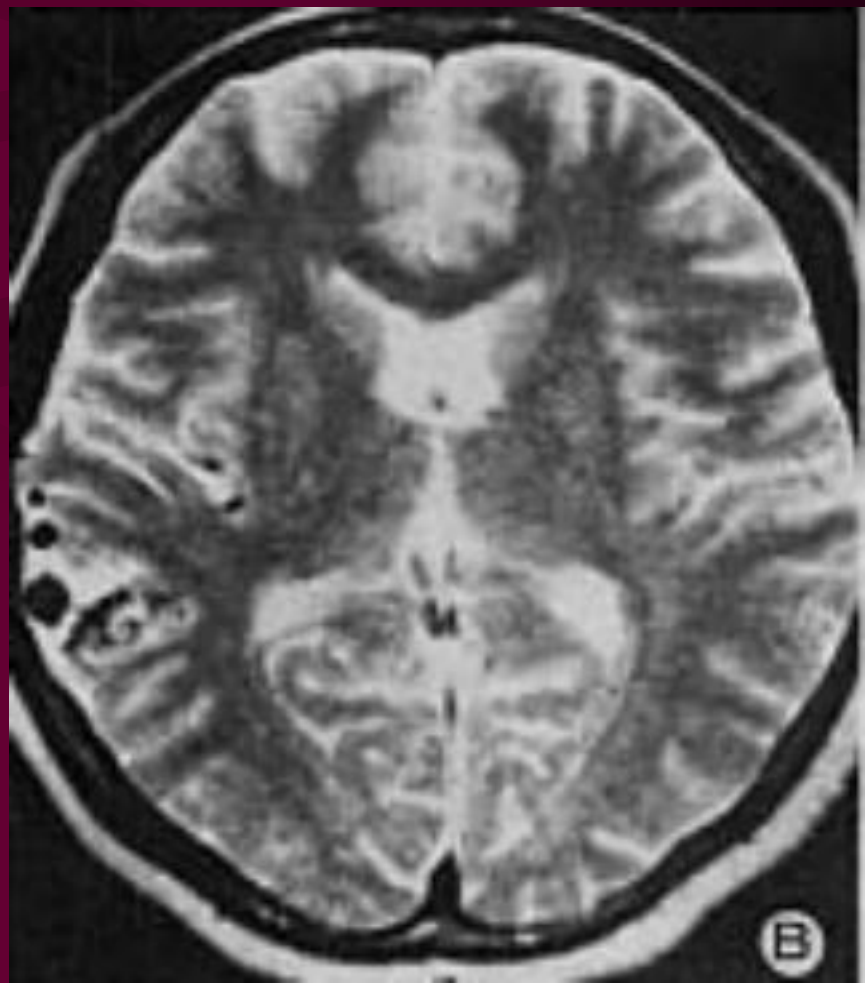

a little closer.... closer...
Get more funny pics at www.TwistedHumor.com
The World's Largest 'FREE' Humor Site

AVM—MRI表现

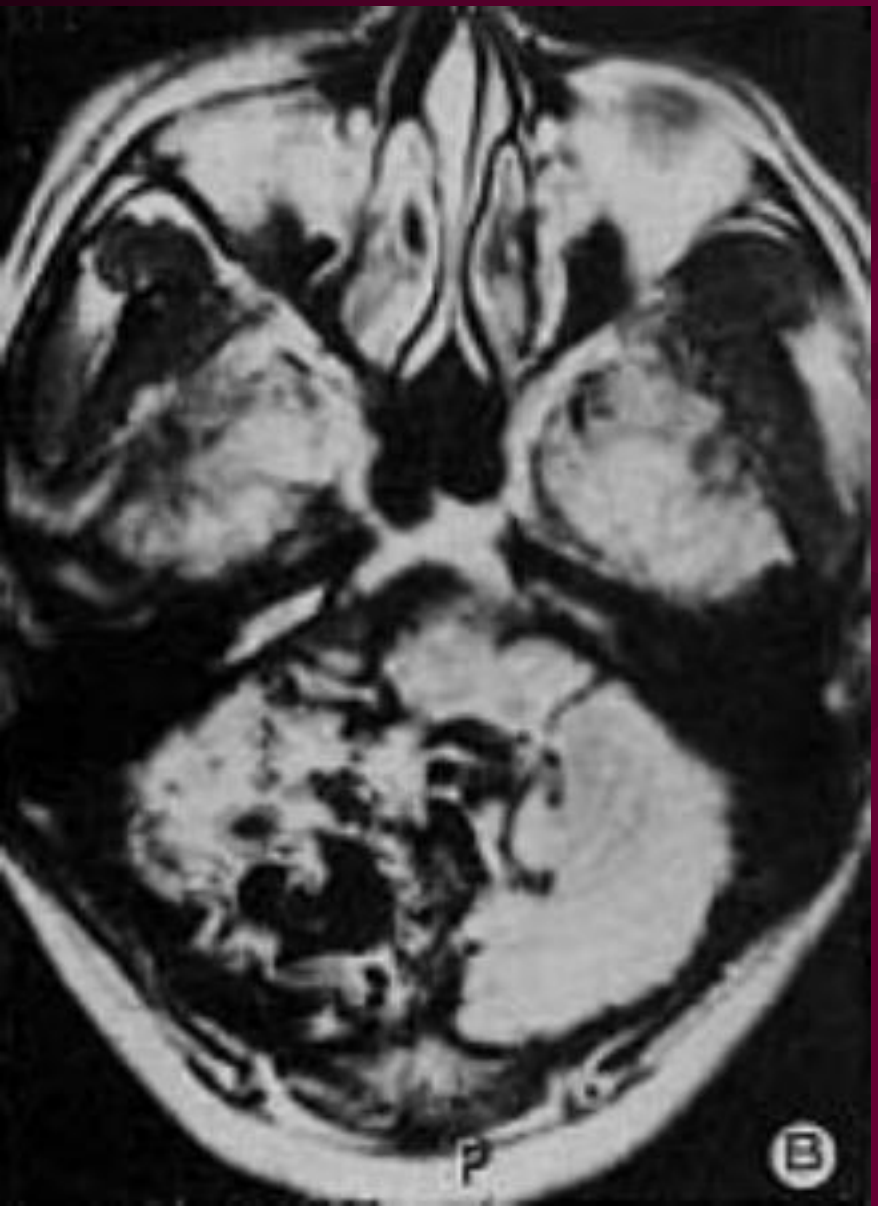
1、AVM中的血管成分T1W和T2W均为低信号。
2、AVM中的回流静脉T1W低信号T2W高信号。
3、AVM中的钙化T1W和T2W低信号
4、血栓形成，T1W和T2W均为高、低混杂信号。出血均为高信号。

AVM-MRI表现





AVM-MRI表现



AVM-MRI表现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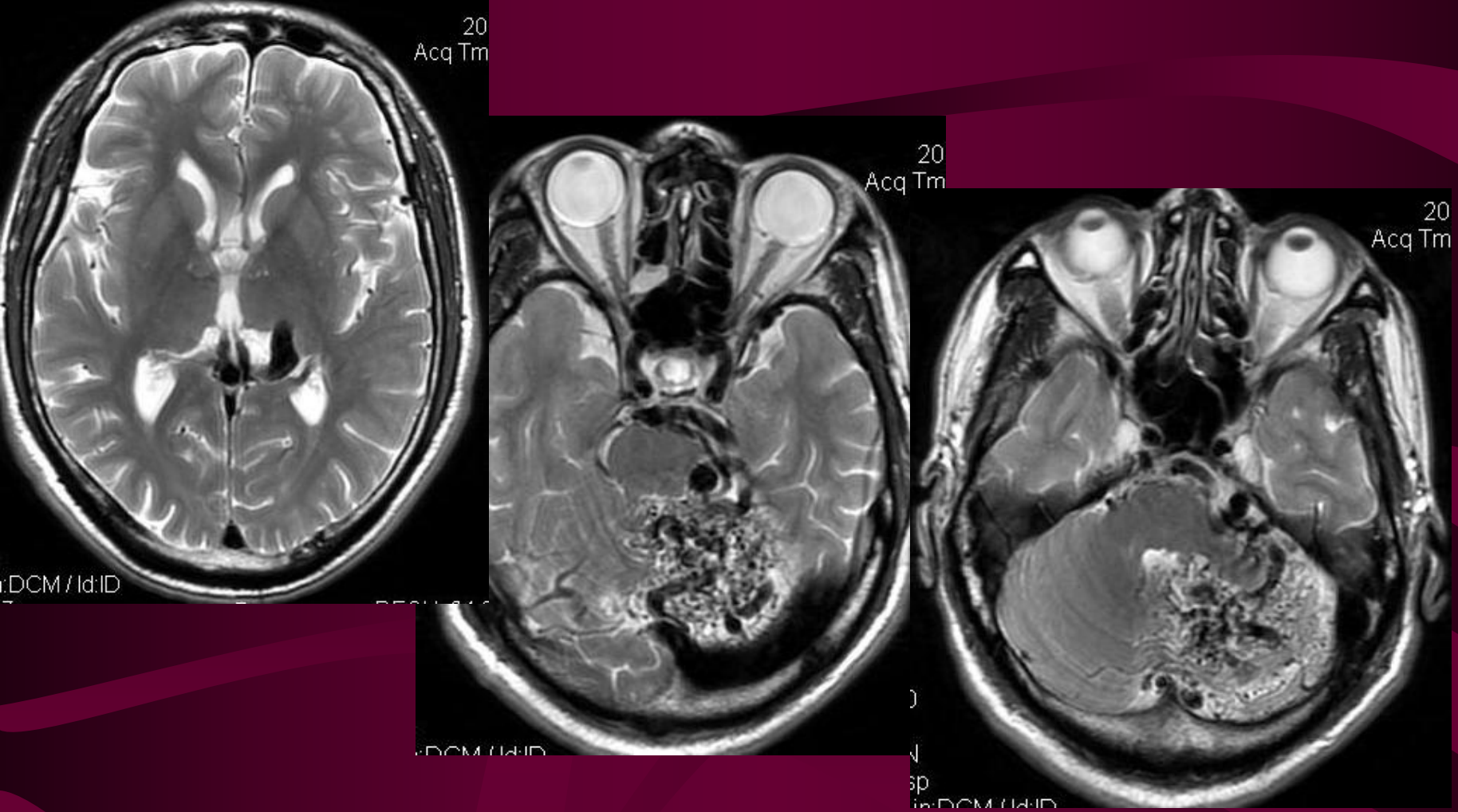
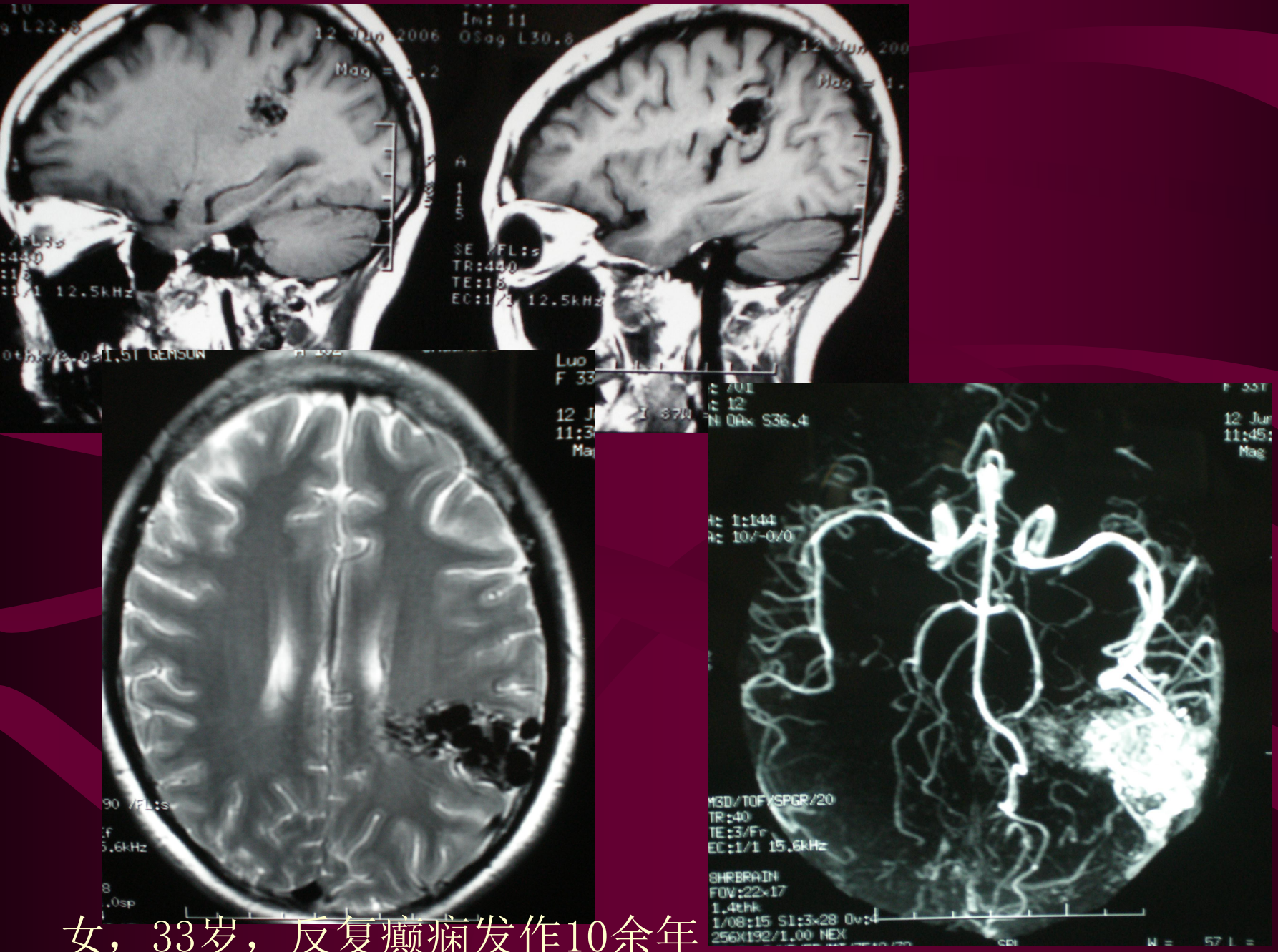
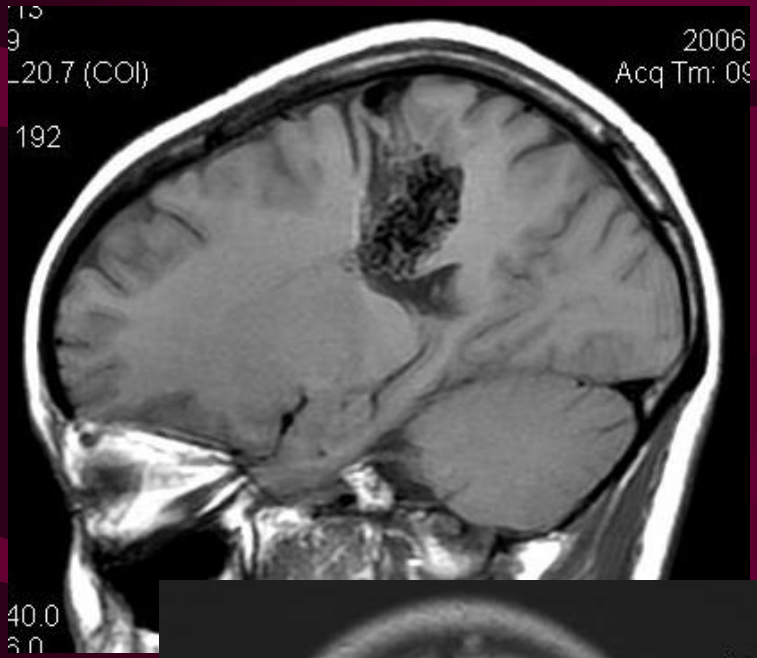


男，15岁。小脑血管畸形MRI表现，异常血管呈粗细不均流空影。



女，33岁，反复癫痫发作10余年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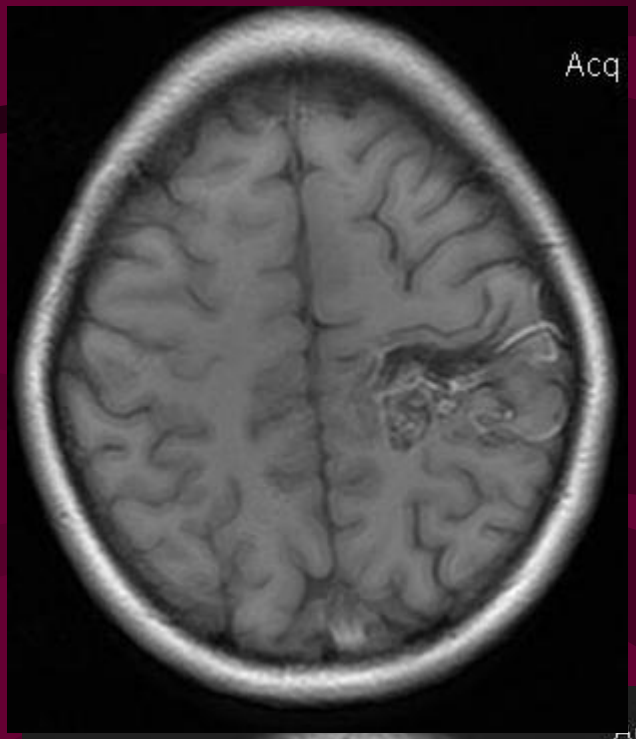
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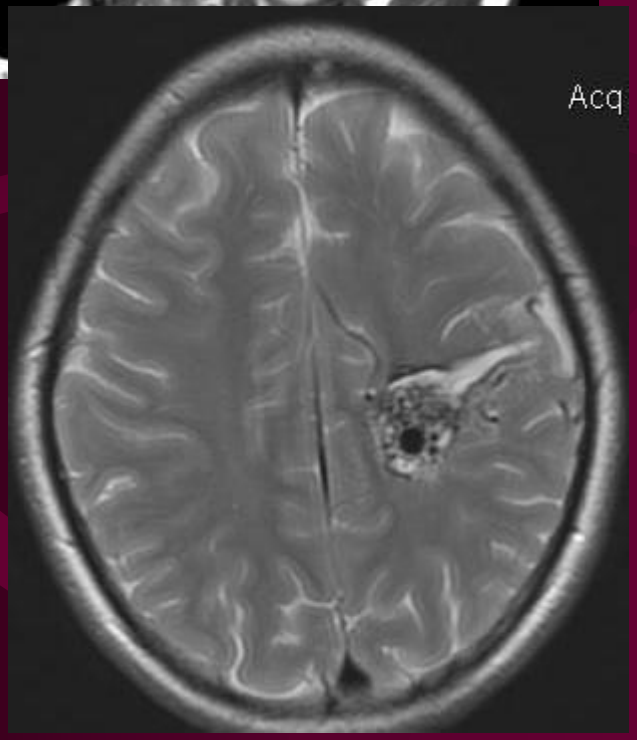
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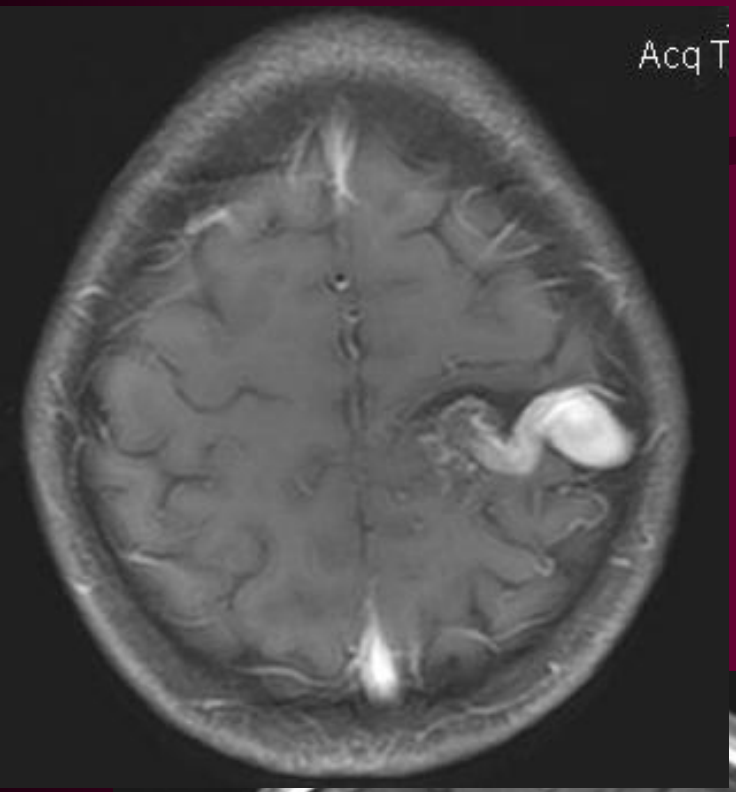
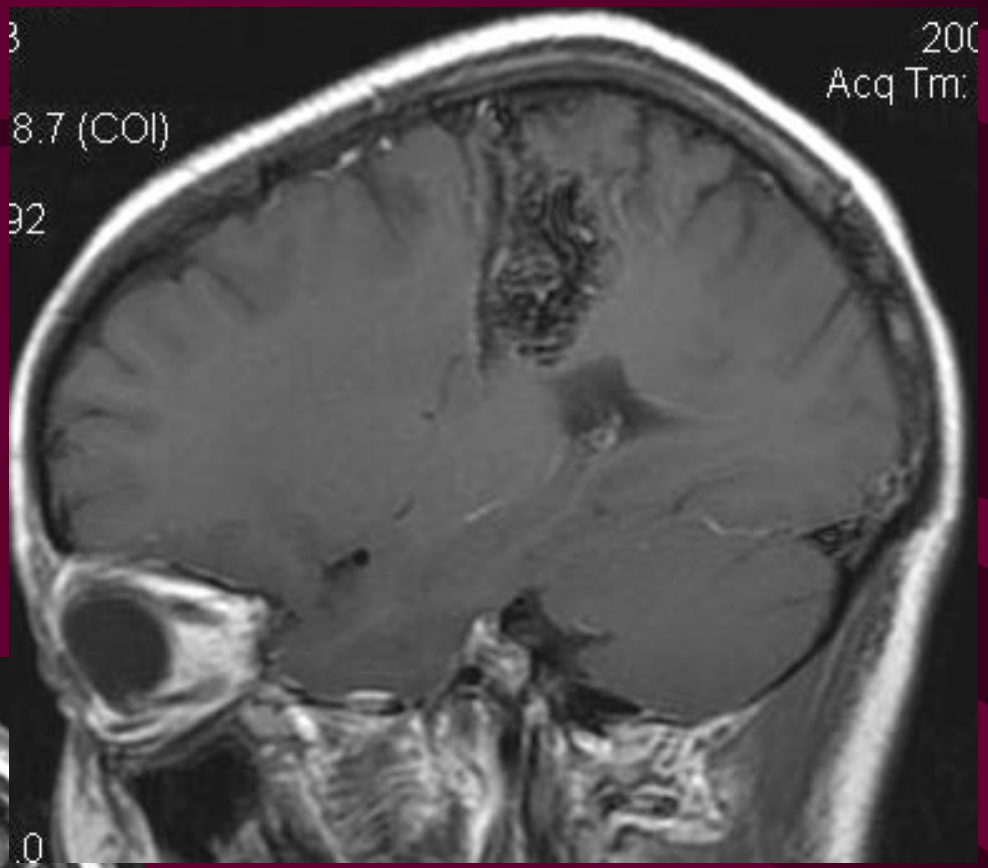
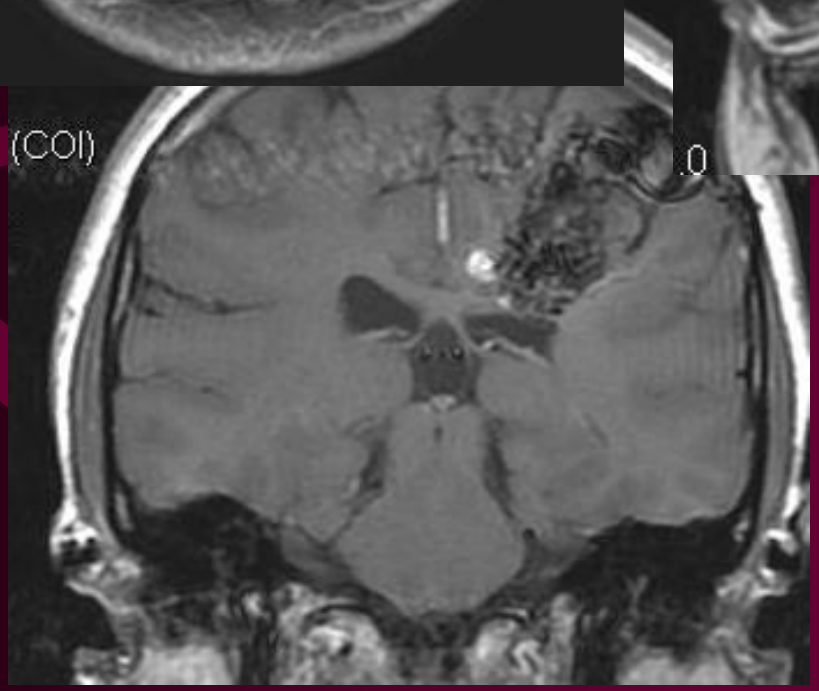






女，18岁，反复头痛伴癫痫发作12年。

脑梗塞影像学

脑梗塞cerebral infarction

脑梗塞是指血管阻塞而造成的脑组织缺血性坏死或软化

原因：1、血栓形成

2、栓塞

3、脑血液循环障碍

CT确诊率66～90％

脑梗塞—病理

脑梗塞大致分为3个时期：

坏死期12～24小时

吞噬期24～72小时

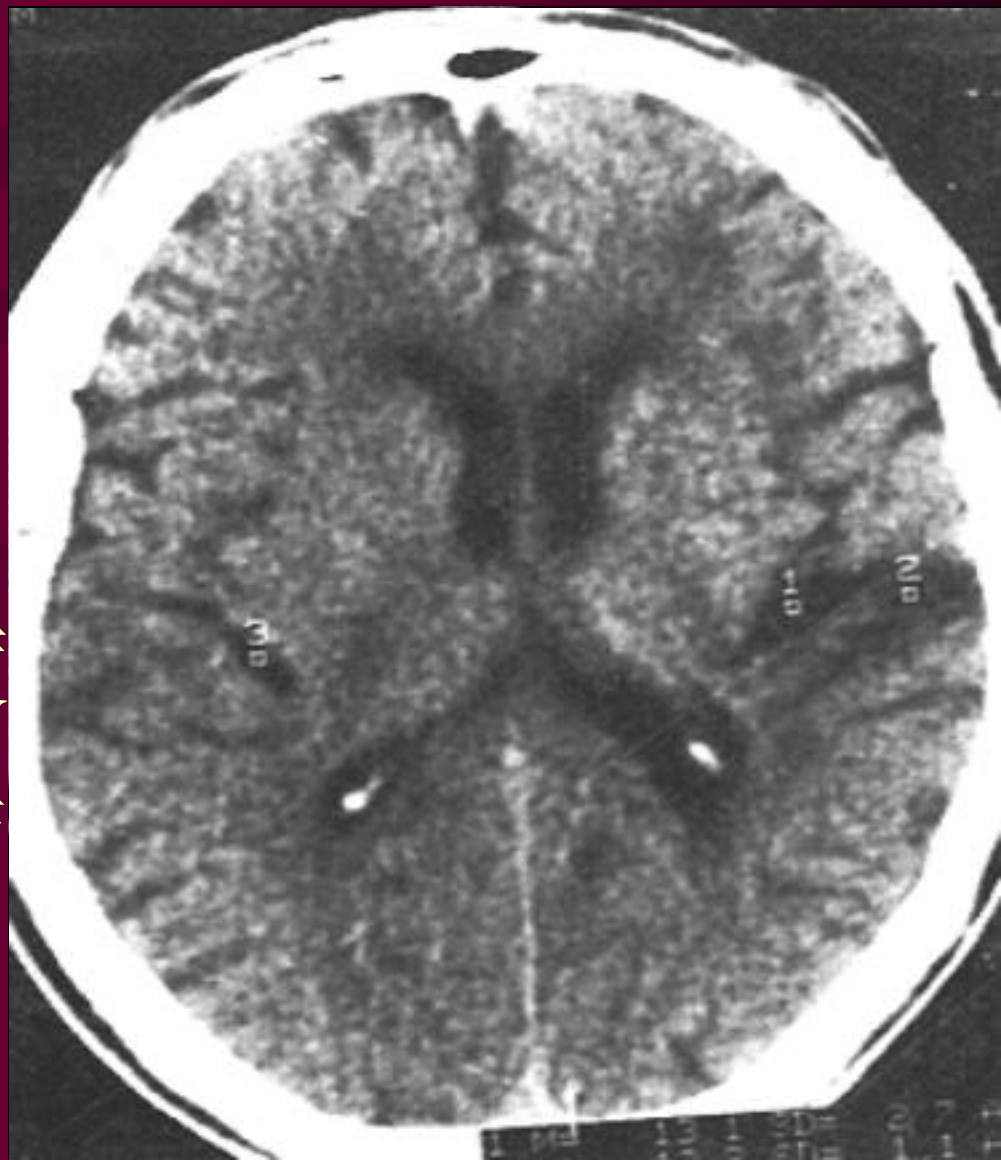
机化期　4～5天后

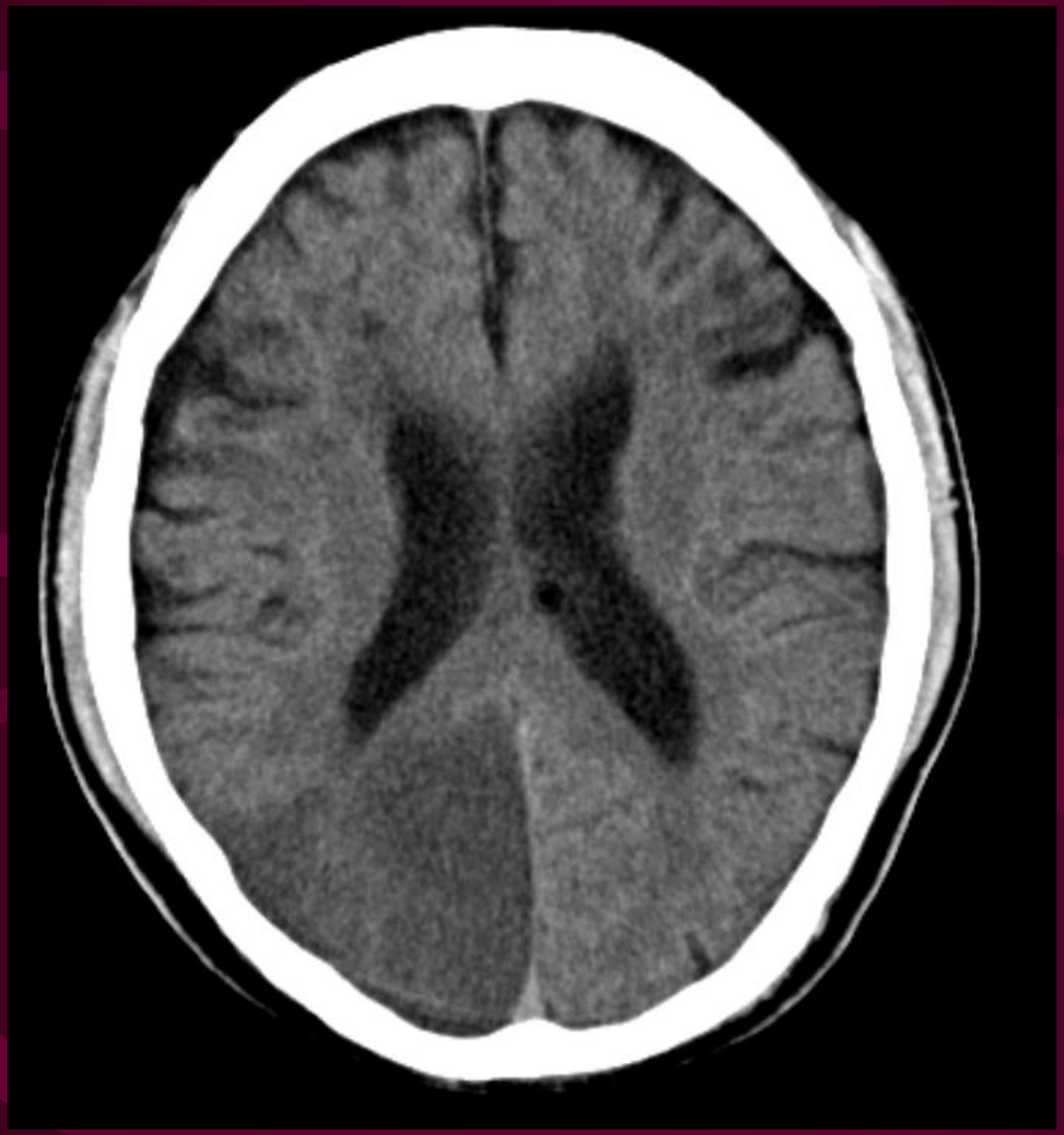
脑部血液循环障碍后发生的梗死，常在发病数小时后，但多数在最初24小时内查不出密度变化。

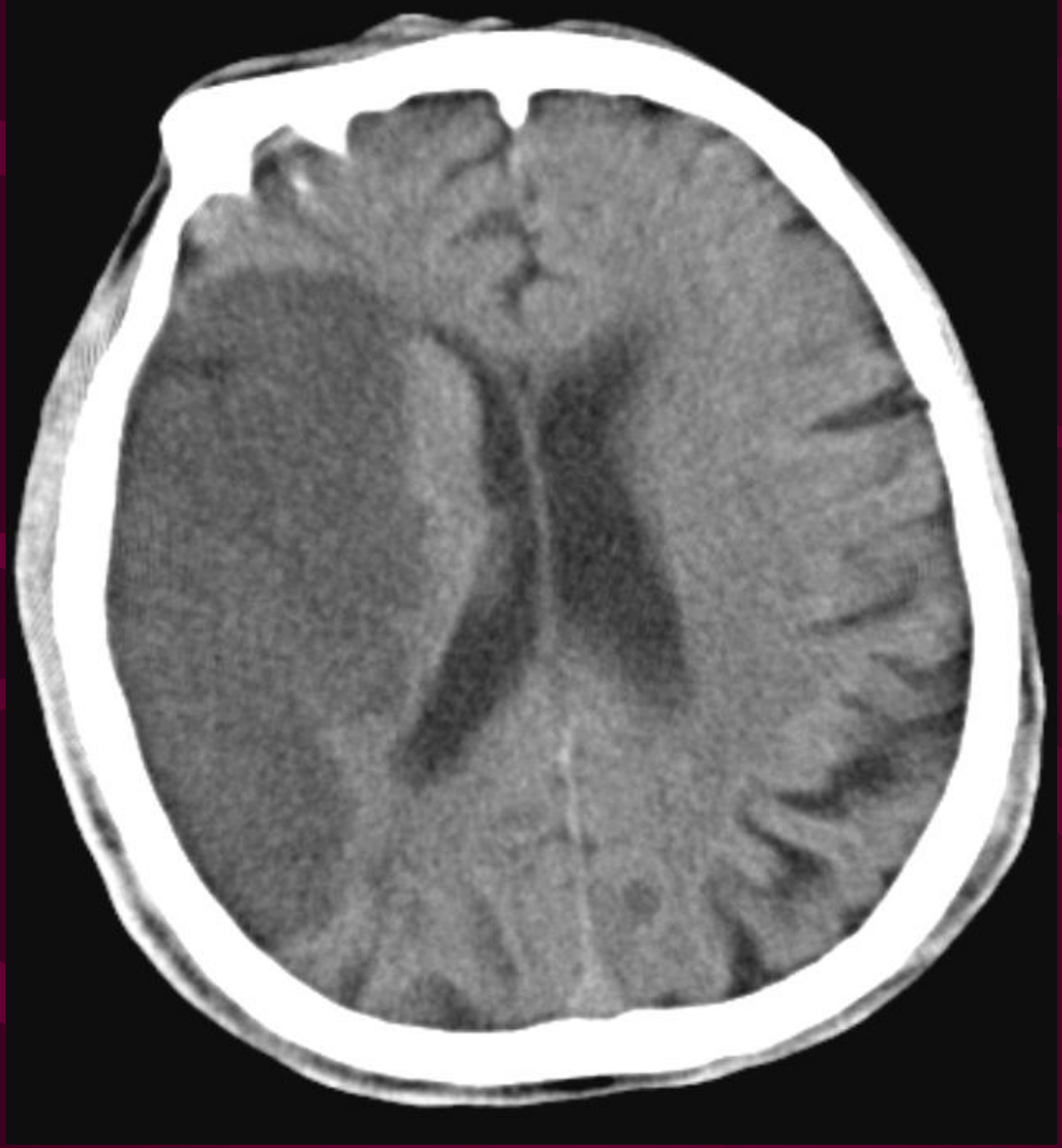
脑梗塞—CT表现

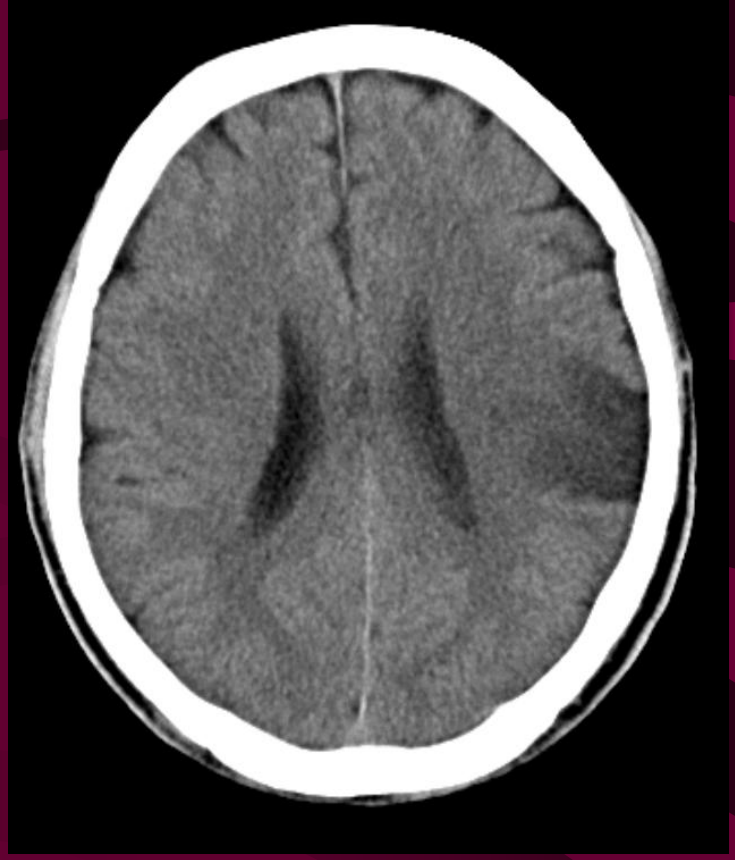
1、梗塞发病后24小时内多为阴性。

2、大部分病例在24小时后见低密度灶，部位、形态与闭塞的血管有关。









脑梗塞—CT表现

3、**梗塞后2～15天，**组织坏死和细胞水肿达顶峰，密度更低，较均匀，边界清楚，**可出现脑水肿和占位征象**。脑水肿的出现率20～70%，一般在梗塞后**3周基本消退**。

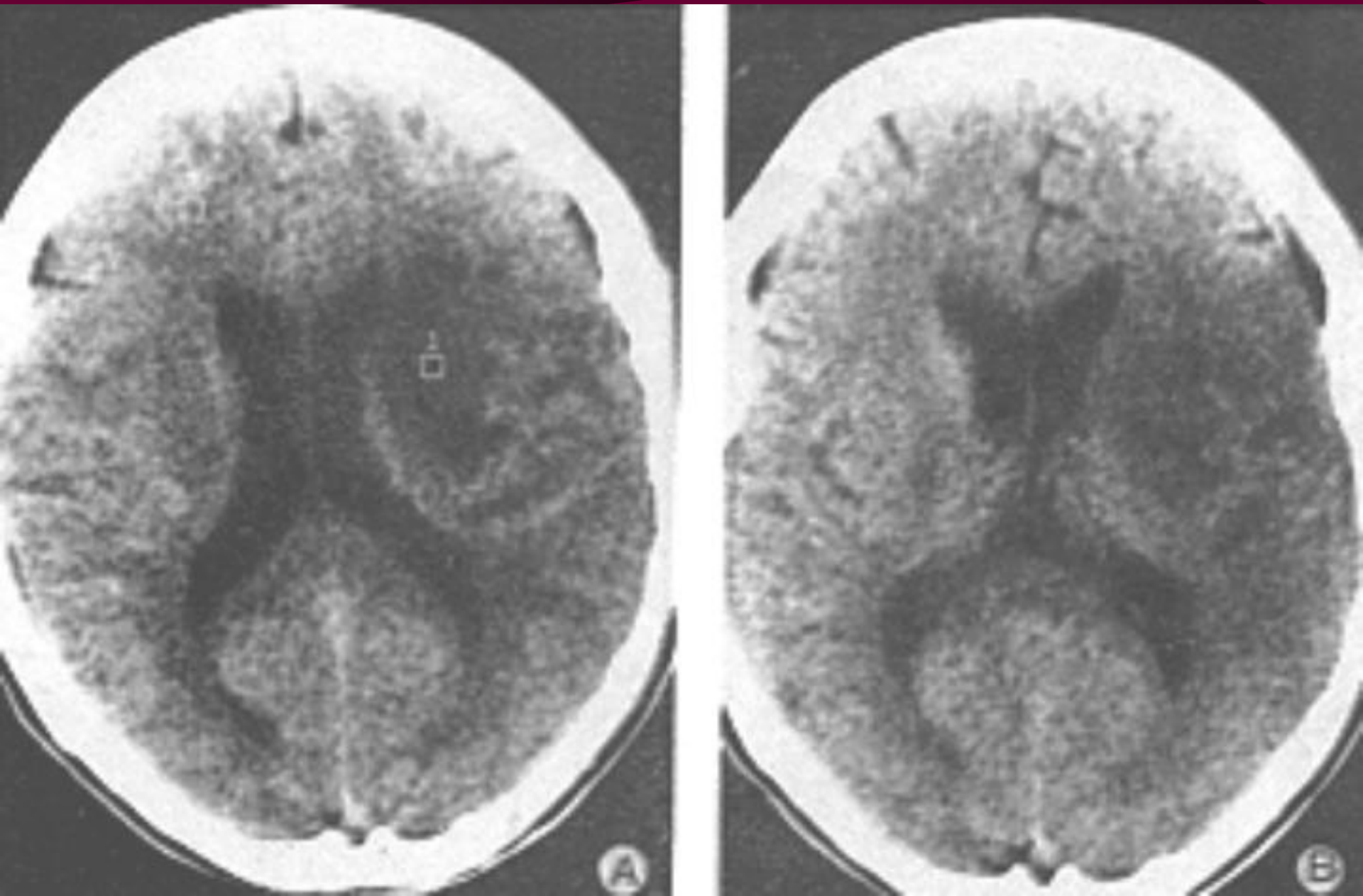
男性,67岁,突发右侧肢体瘫痪2天余。
左侧颞叶脑梗塞CT表现。

脑梗塞—CT表现

4、模糊效应：

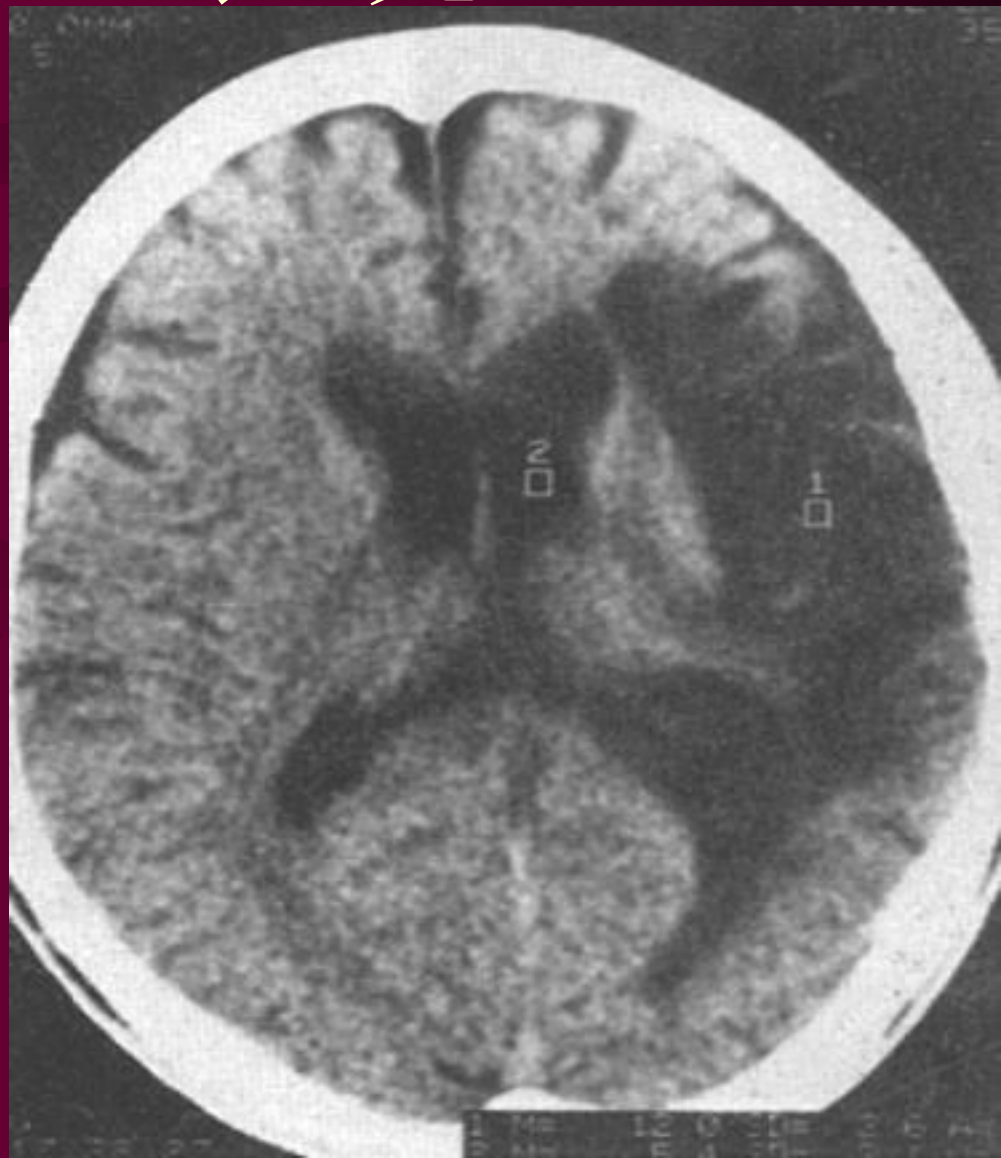
梗塞后2～3周，梗塞灶内和边缘出现弧形或结节状等密度或稍高密度，有时病灶边缘不清楚，较小的病变可变为等密度。

脑梗塞—CT表现



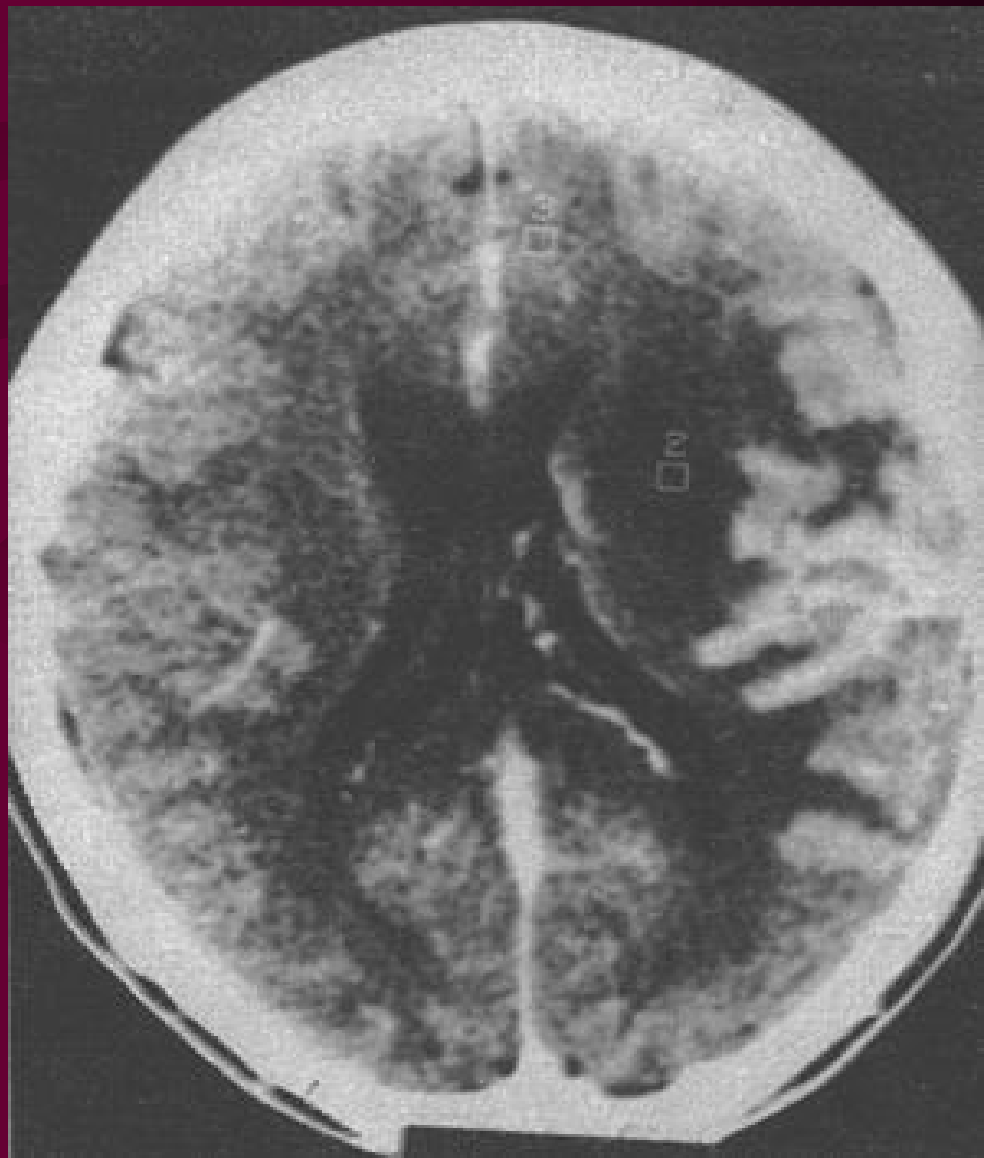
脑梗塞－CT表现

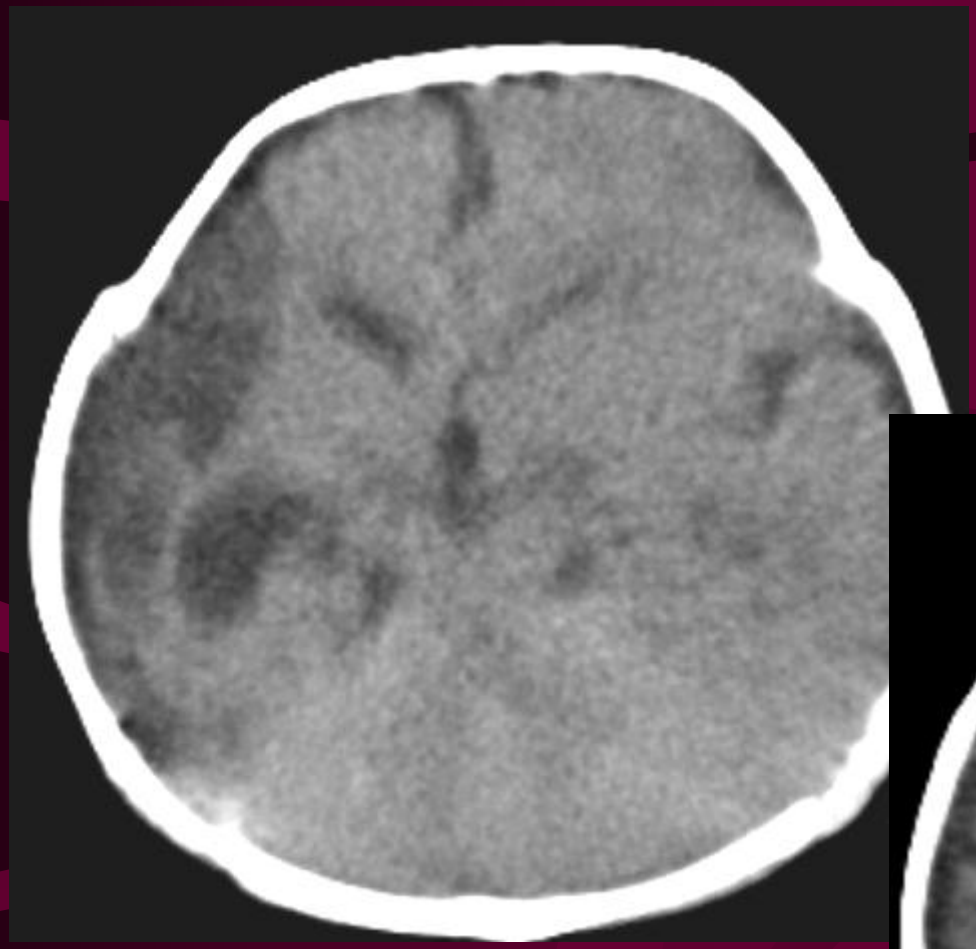
5、梗塞后4～5周，梗塞灶的密度与脑脊液相似。邻近的脑组织萎缩。

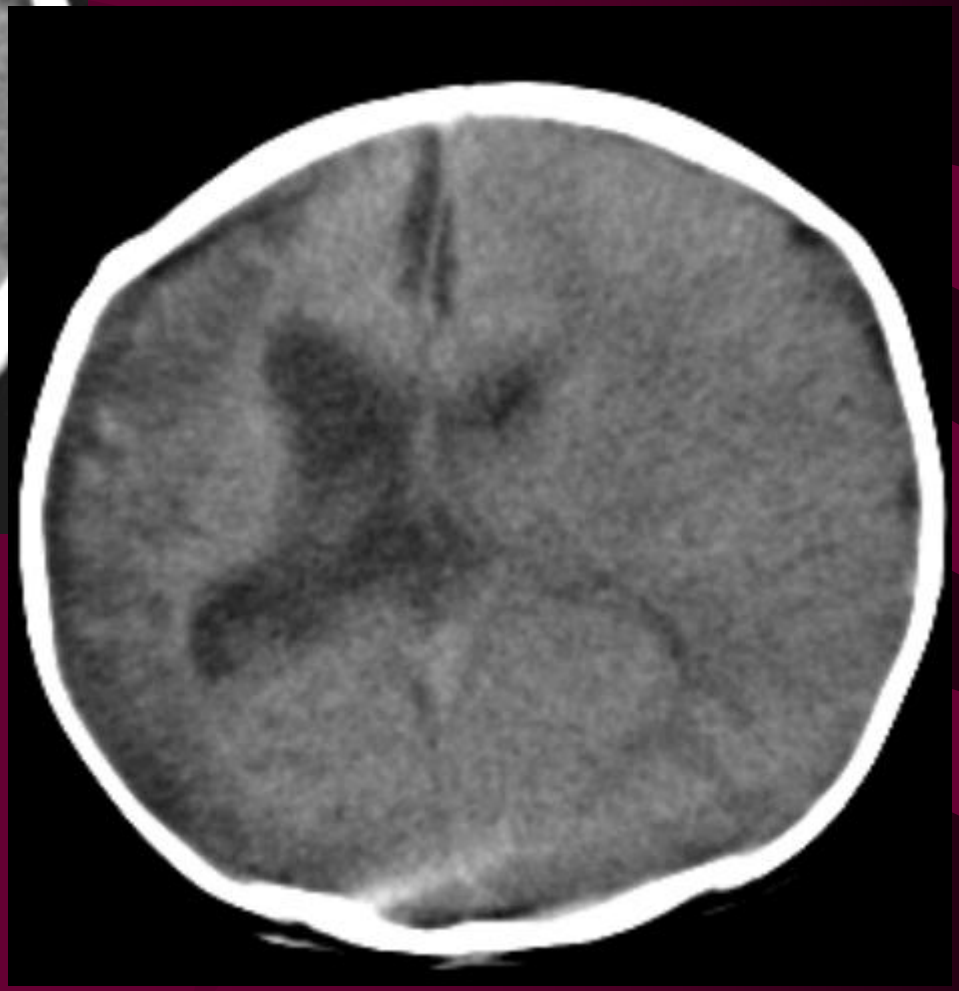


脑梗塞—CT表现

6、增强扫描：5～6天出现强化。2～3周发生率最高，强化最明显。持续1月或更久。



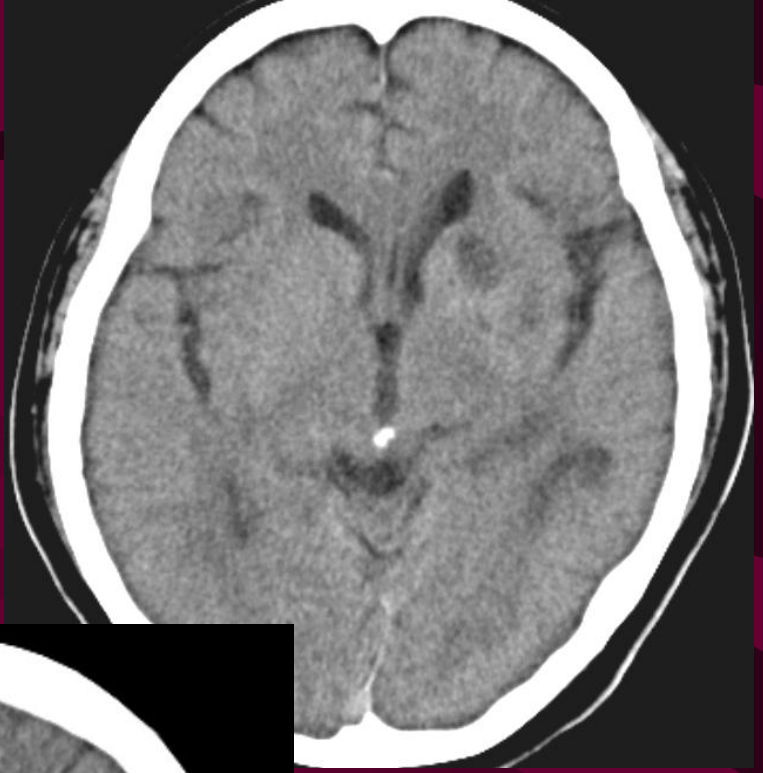


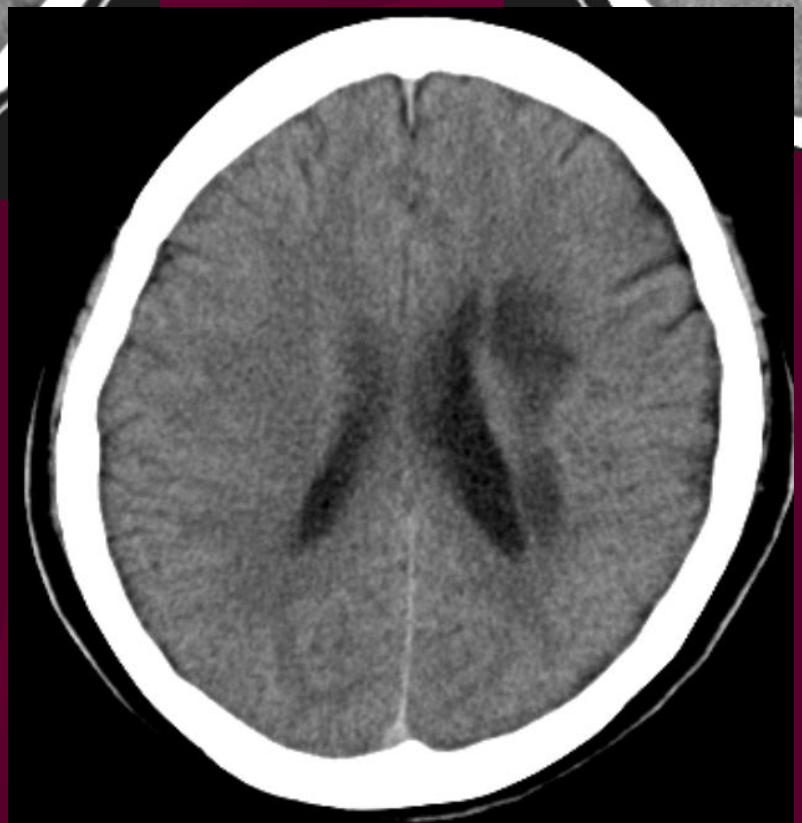


脑软化

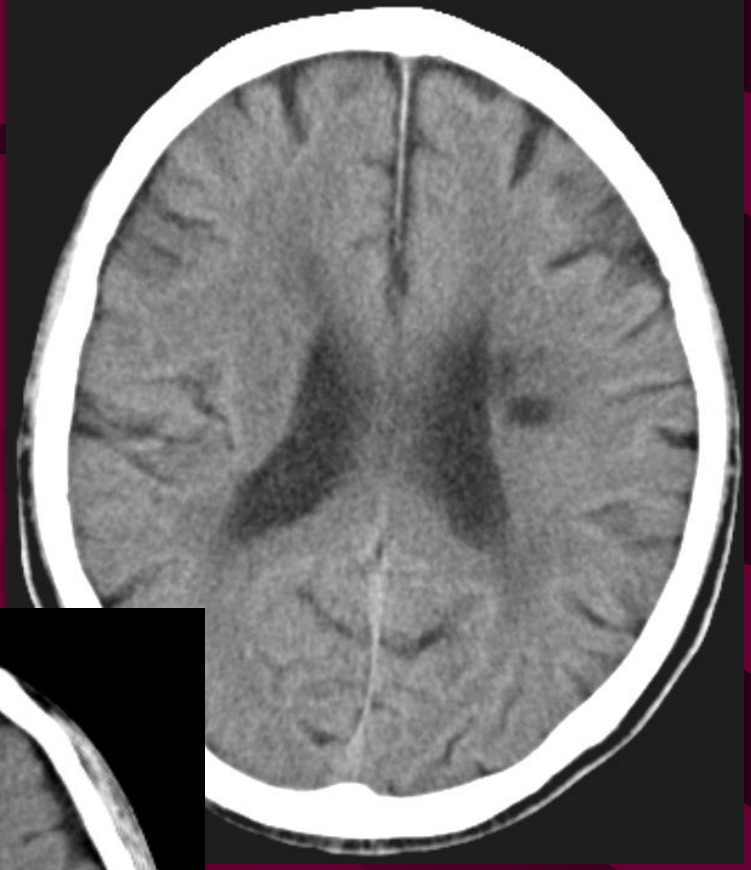
腔隙性脑梗塞
（lacunar infarction）

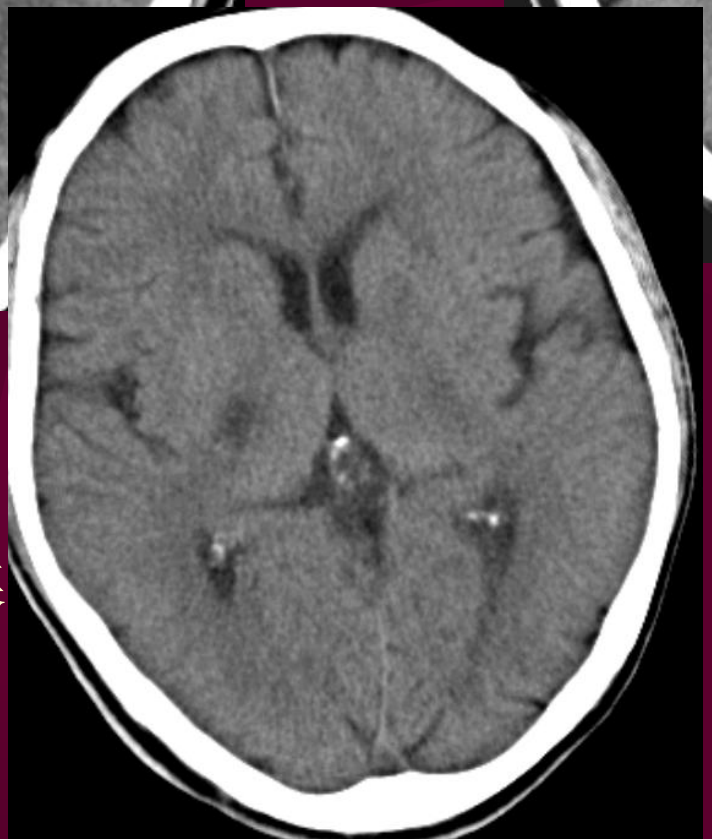
脑穿支小动脉闭塞引起的深部脑组织较小面积的缺血性坏死。直径多在5-15mm，最大可达20-35mm。



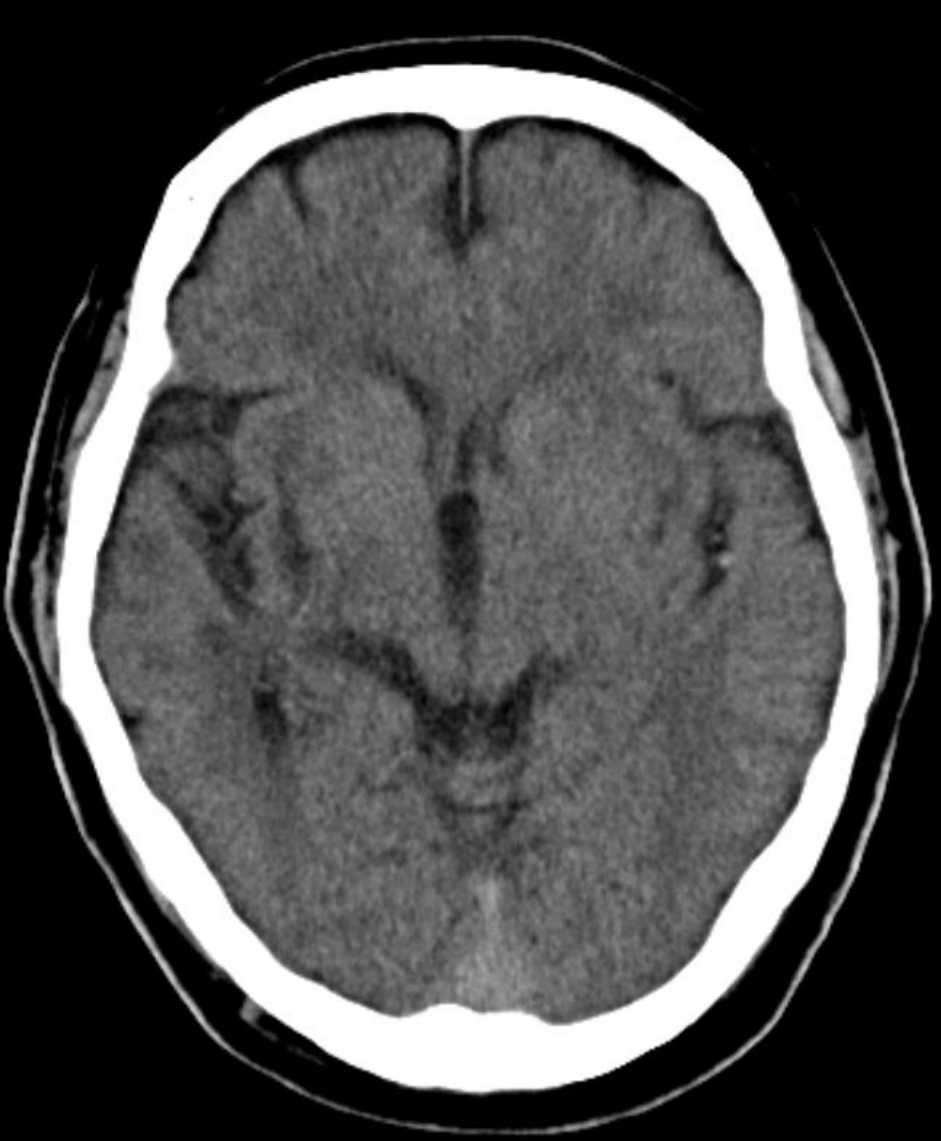


腔隙性脑梗塞





腔隙性脑梗塞

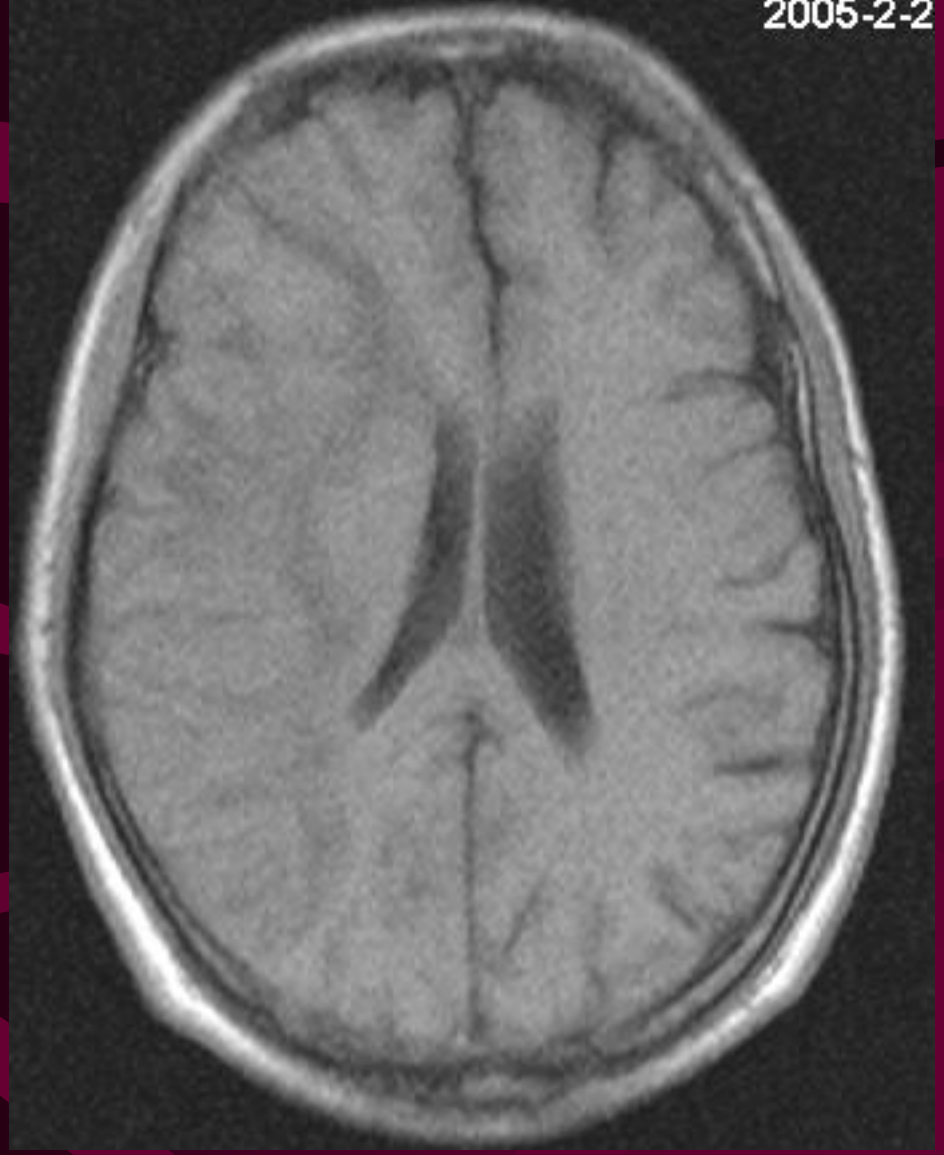


腔隙性脑梗塞

女 66岁。突发意识丧失数小时。
右侧分水岭脑梗塞伴侧脑室旁脑梗塞CT表现。

MRI表现

T1W低信号
T2W高信号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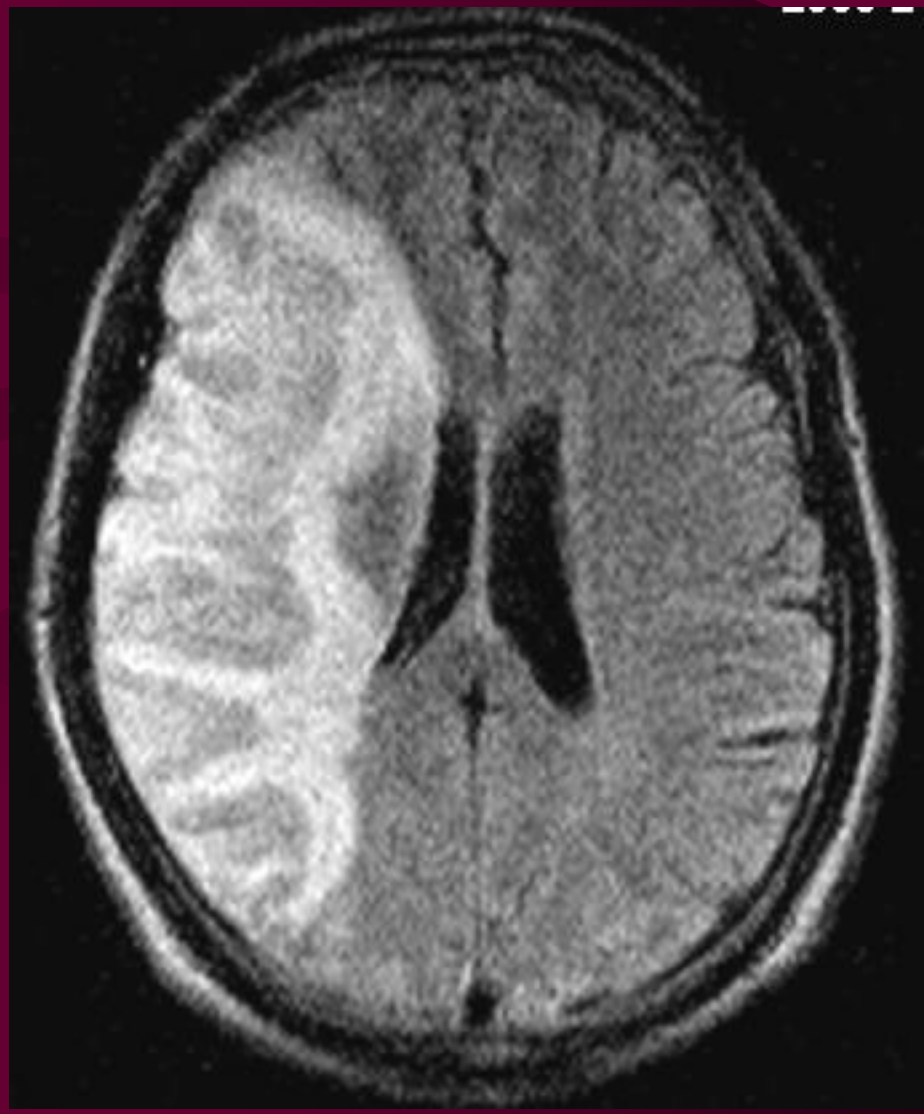
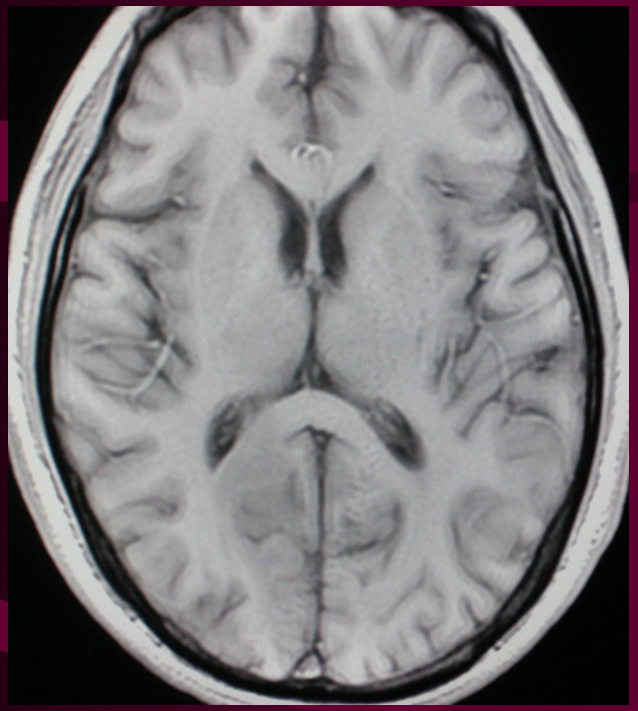
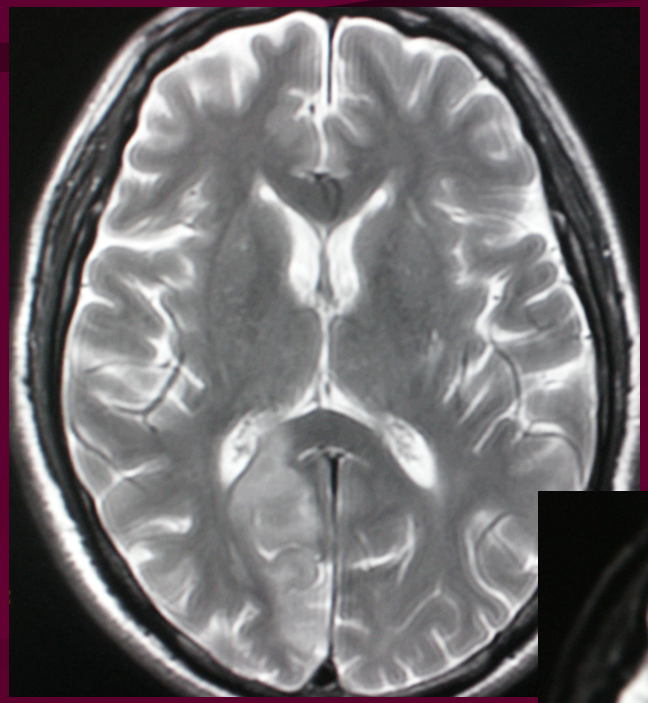
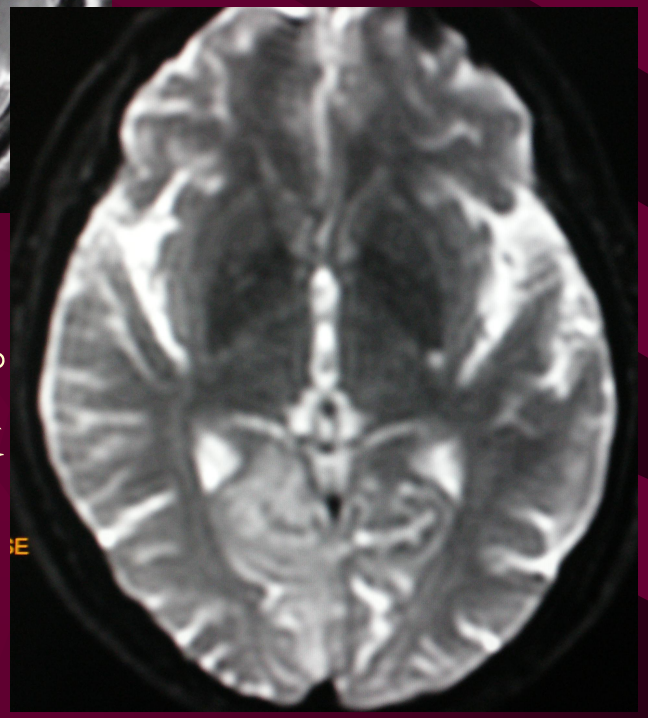
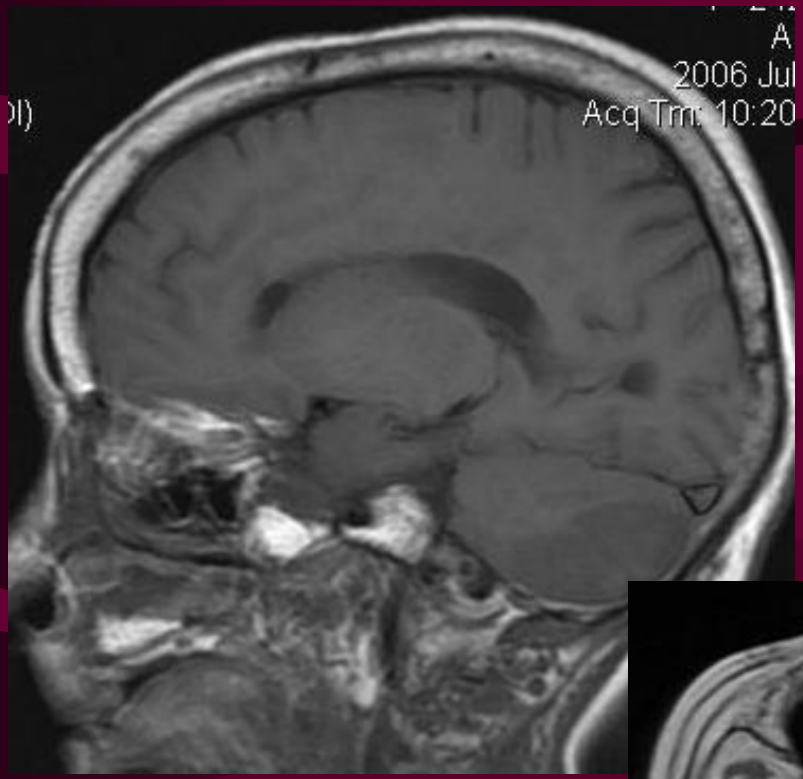








男58岁，突发左侧视力下降3天多。右侧枕叶脑梗塞MRI表现：片状长T1长T2异常信号改变，弥散成像病变呈明显高信号改变。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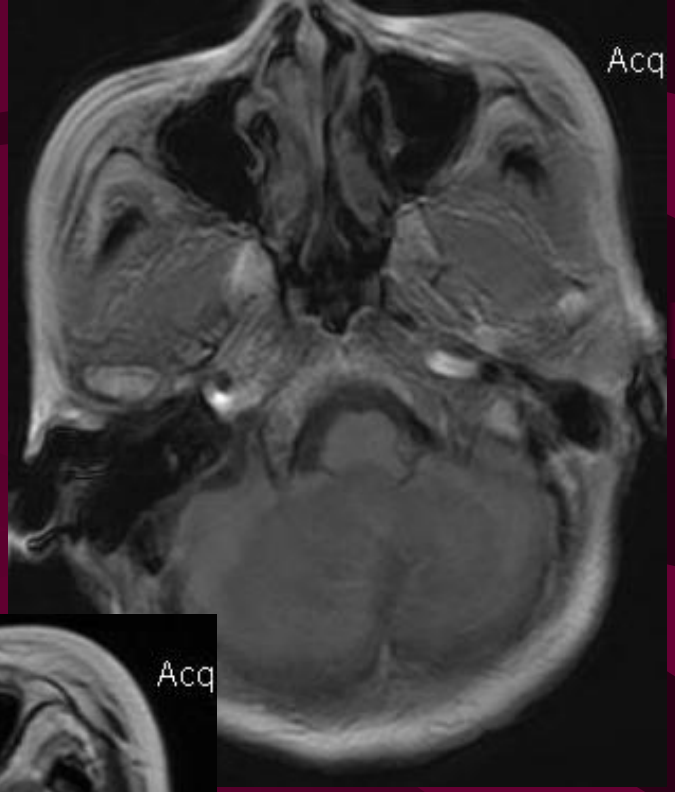
2006 Jul
Acq Tm: 10:20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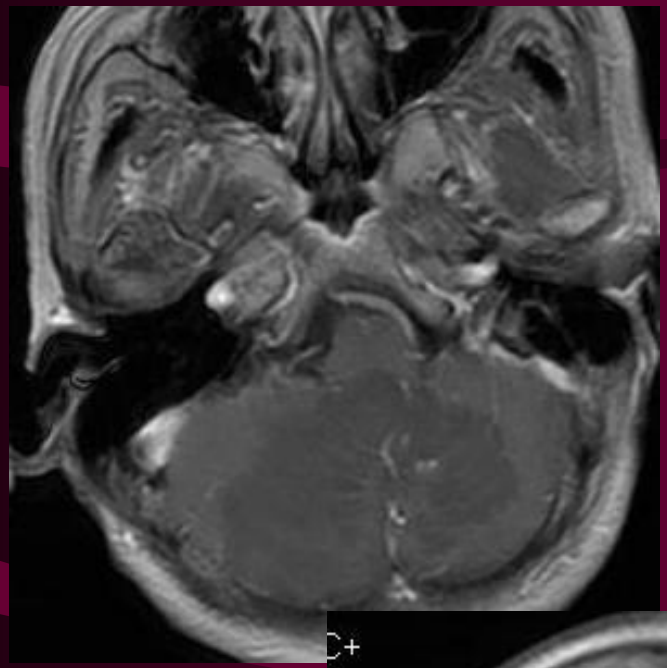
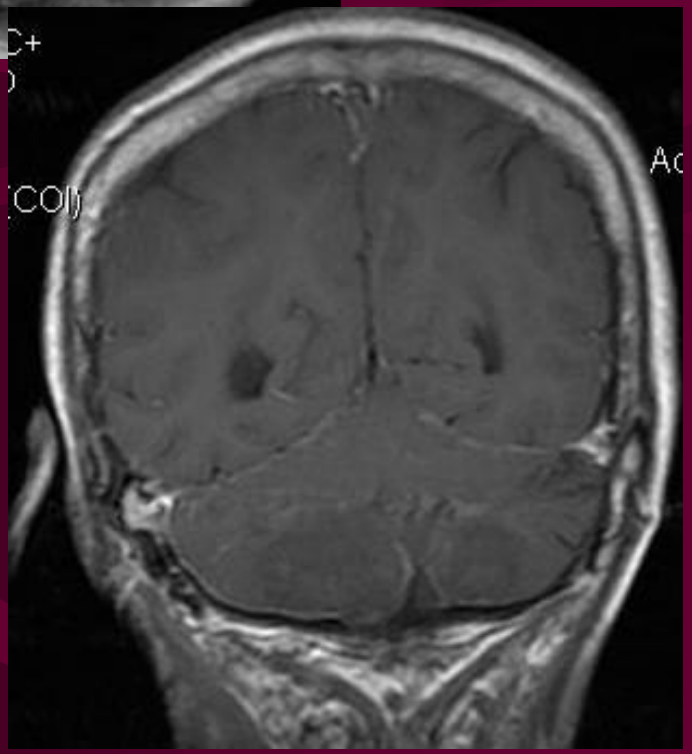
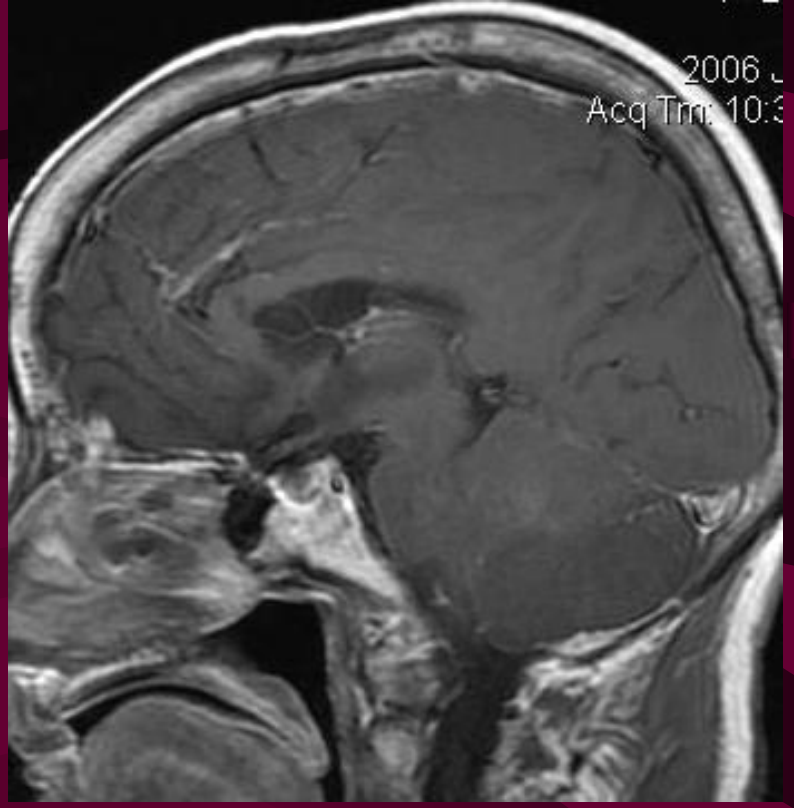
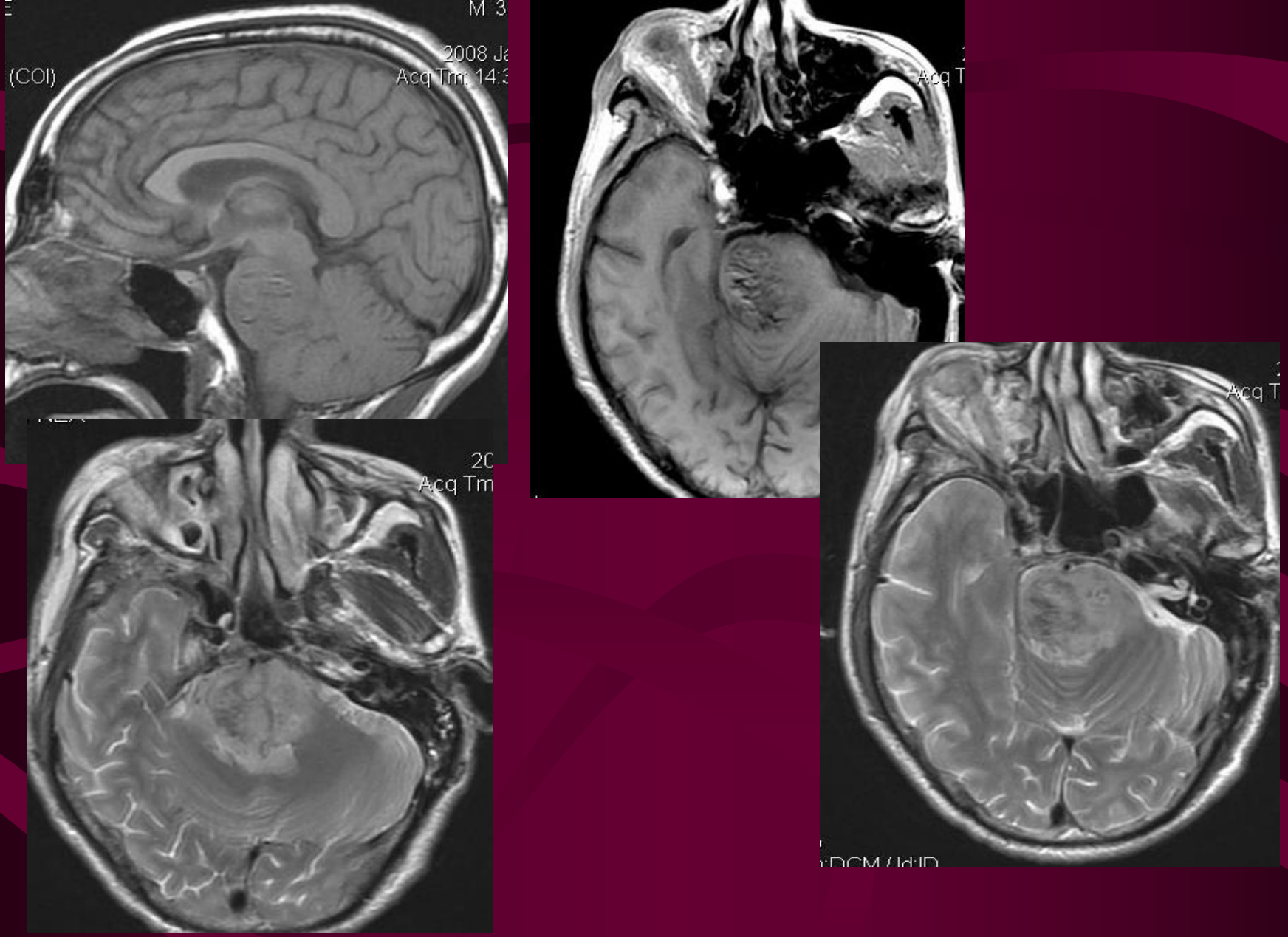
Acq



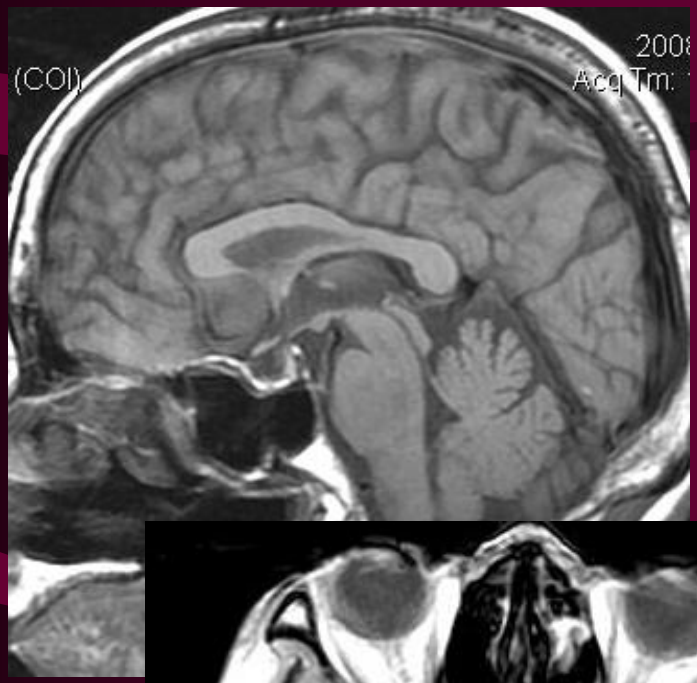


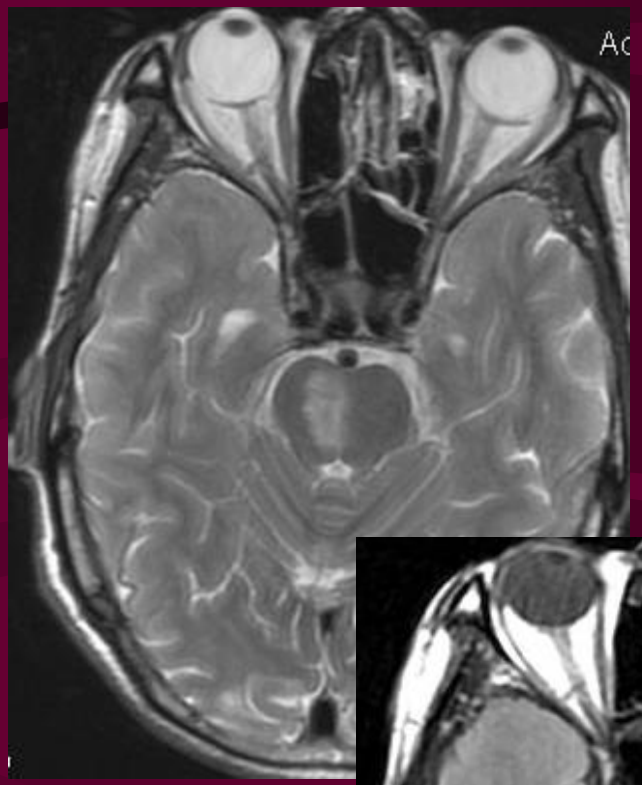


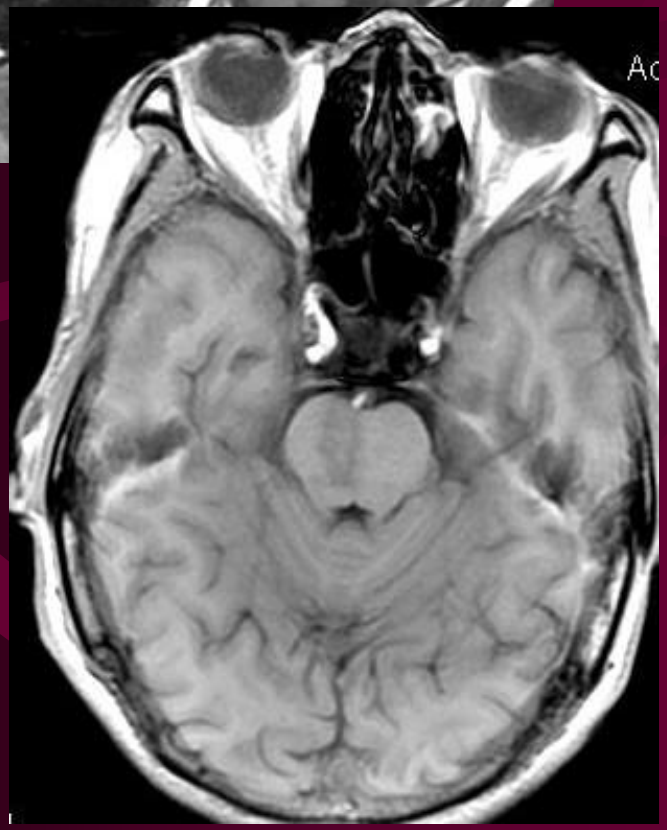
男78岁。行走不稳5天多。

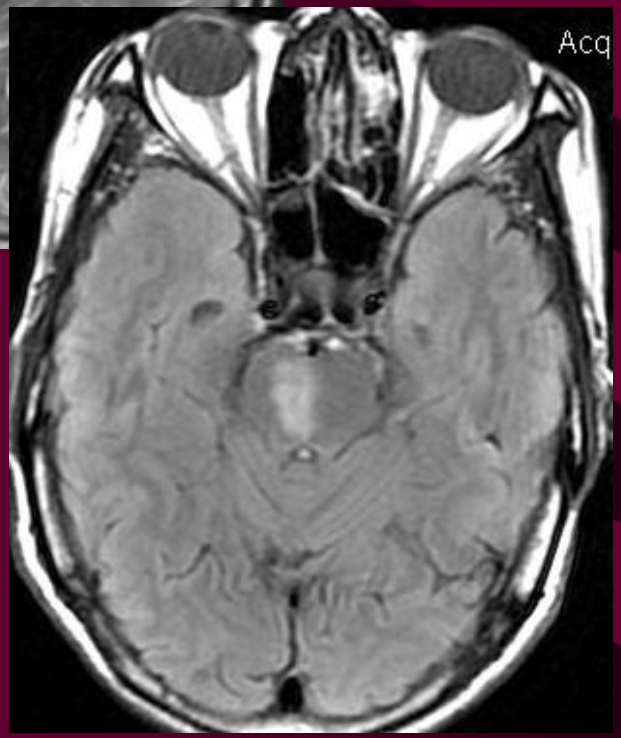


女，66岁，突发意识丧失3天余。脑干出血性脑梗塞MRI表现

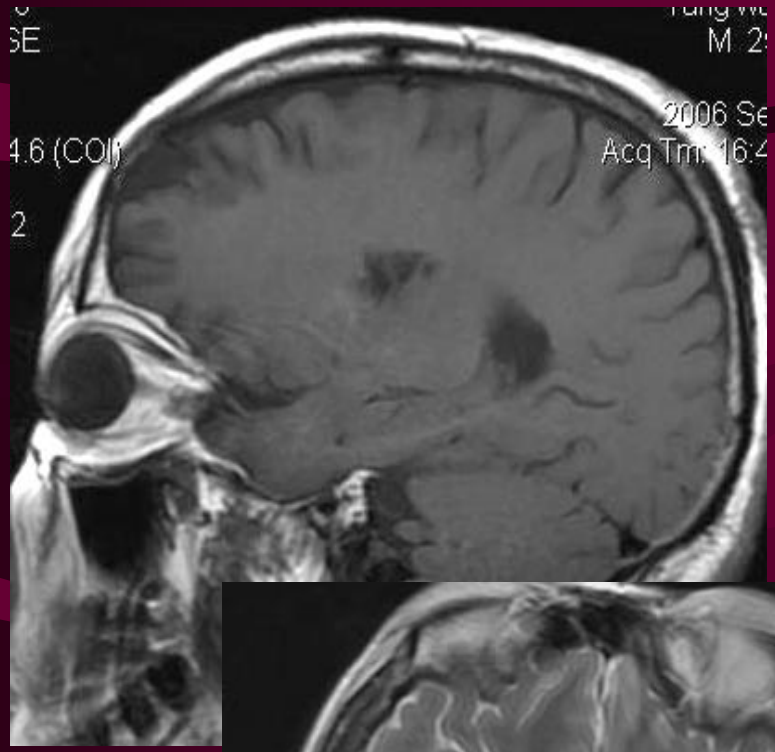


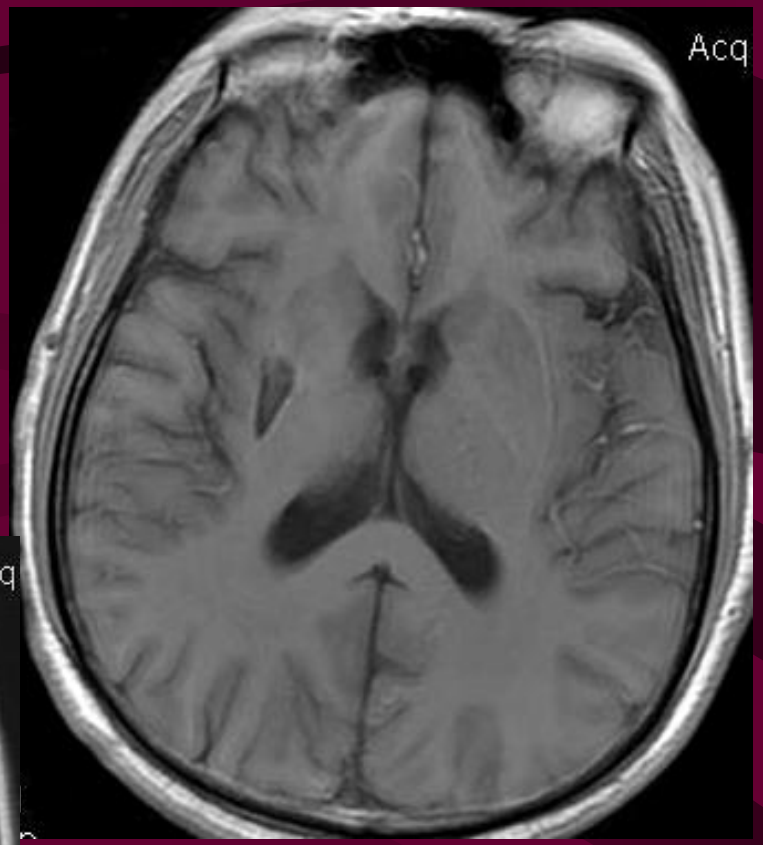


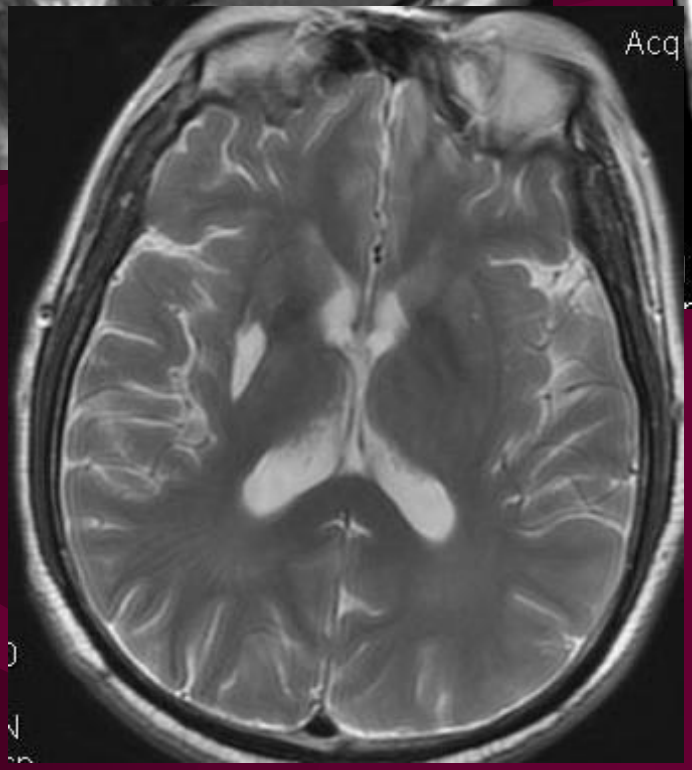




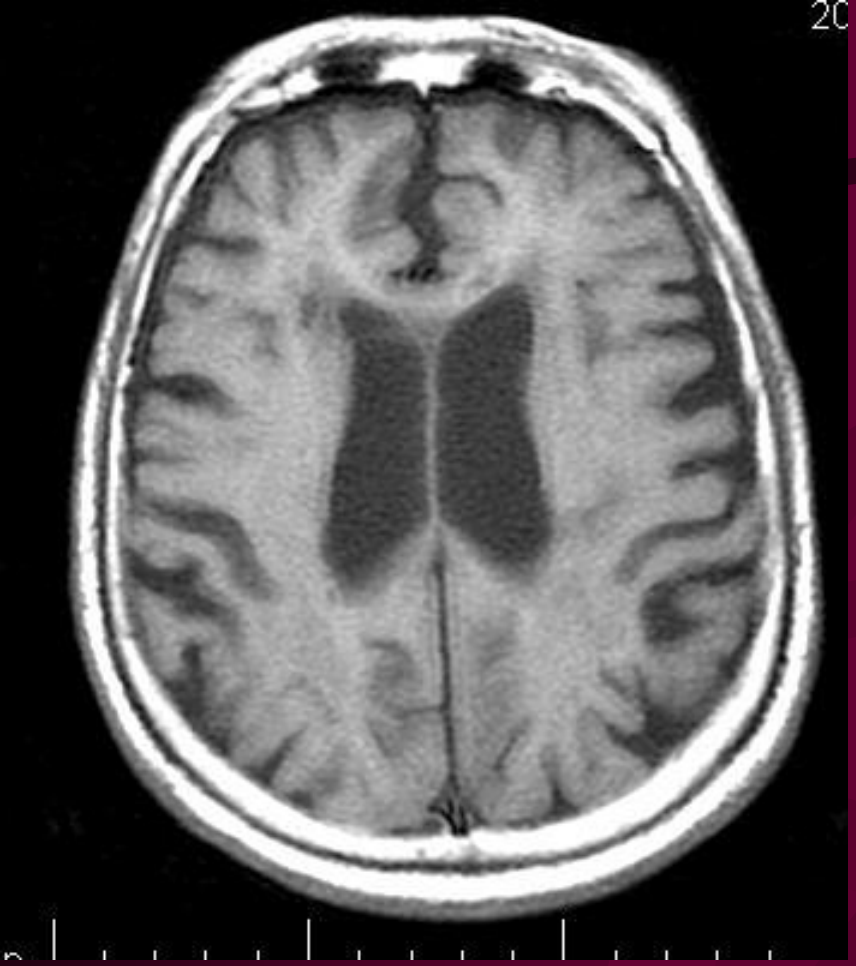
男，78岁。脑干梗塞MRI表现

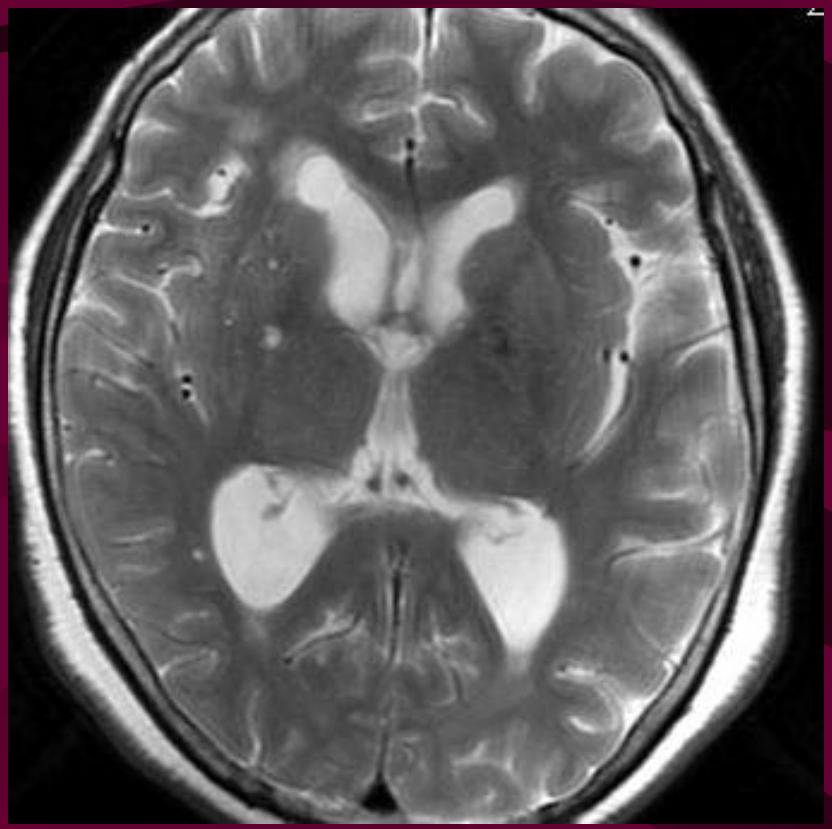






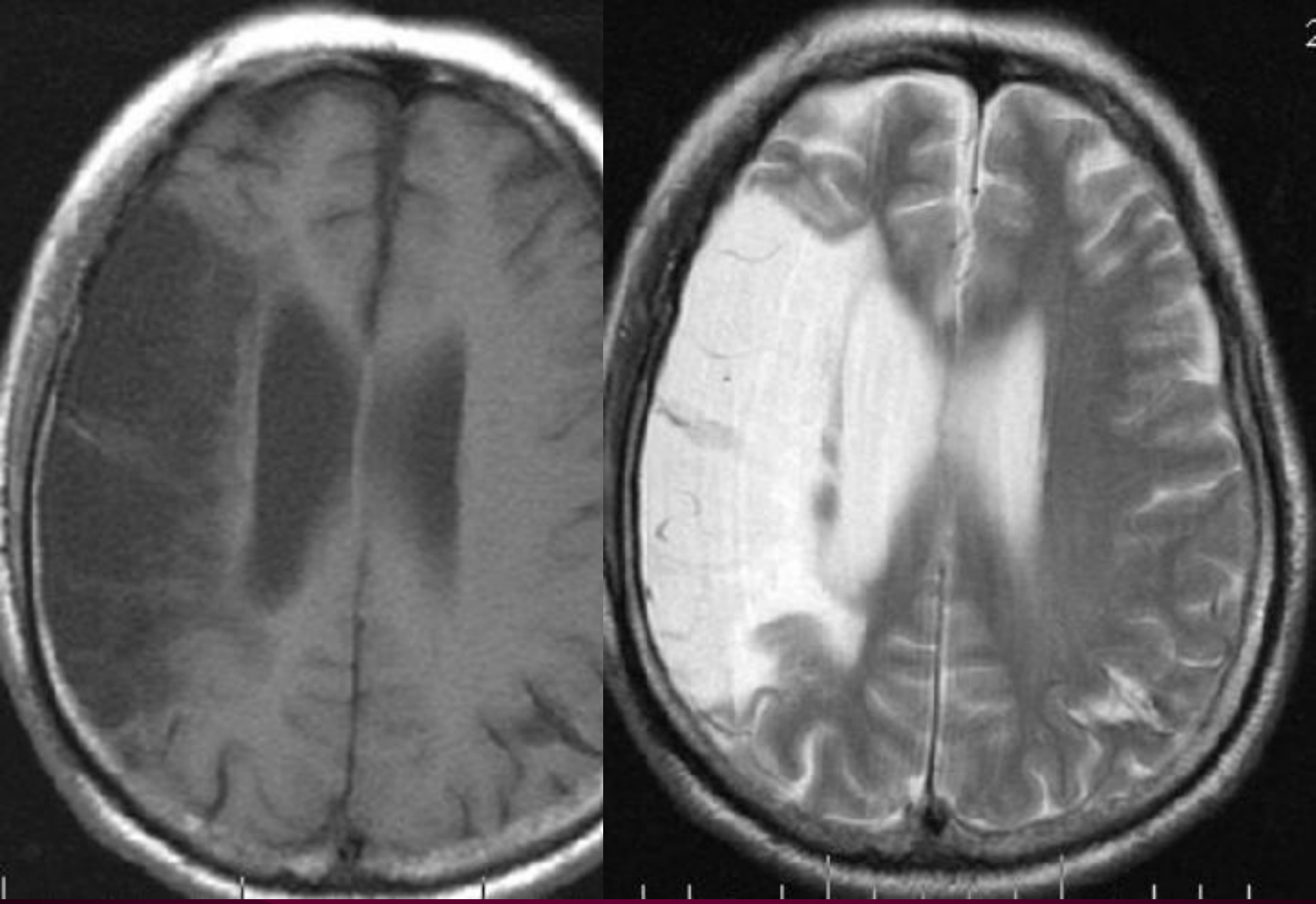
男，58岁。腔隙性脑梗塞





腔隙性脑梗塞

脑软化灶



脑软化灶

脑溢血影像学

脑出血cerebral hemorrhage

指脑实质内出血。

原因：损伤，见外伤

非损伤性：高血压，动脉硬化

AVM，动脉瘤破裂

肿瘤出血

全身出血性疾病

脑出血—CT诊断原理

主要根据不同组织成分对X线吸收系数的不同而产生不同的密度对比。

血液中形成密度影像的主要成分为血红蛋白，其对X线的吸收系数高于脑组织，CT上表现为高密度。

脑出血—CT表现

1、平扫：出血本身造成的高密度区

圆形或卵圆形，边界清楚

CT值50～80HU

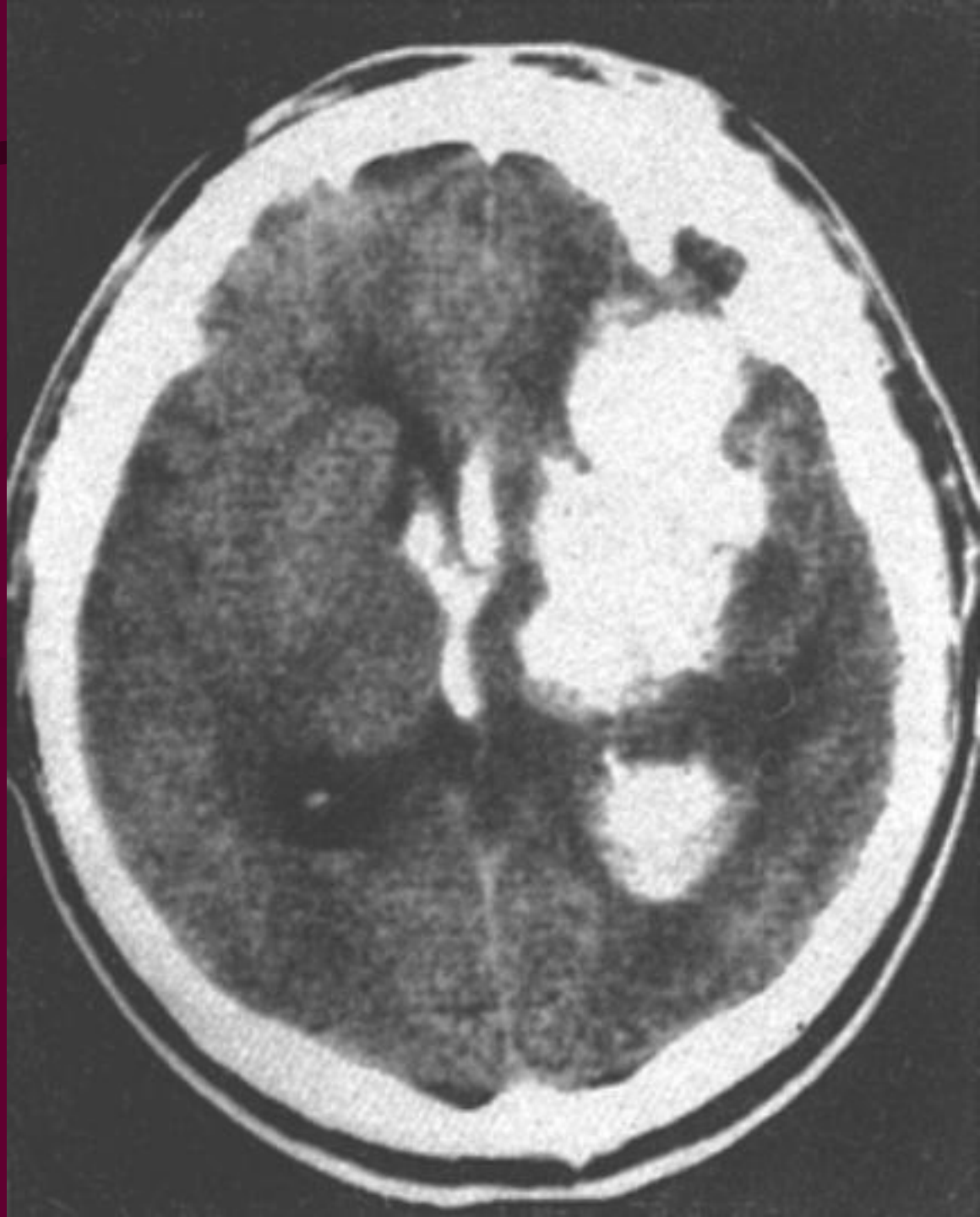
血肿周围常有低密度环影

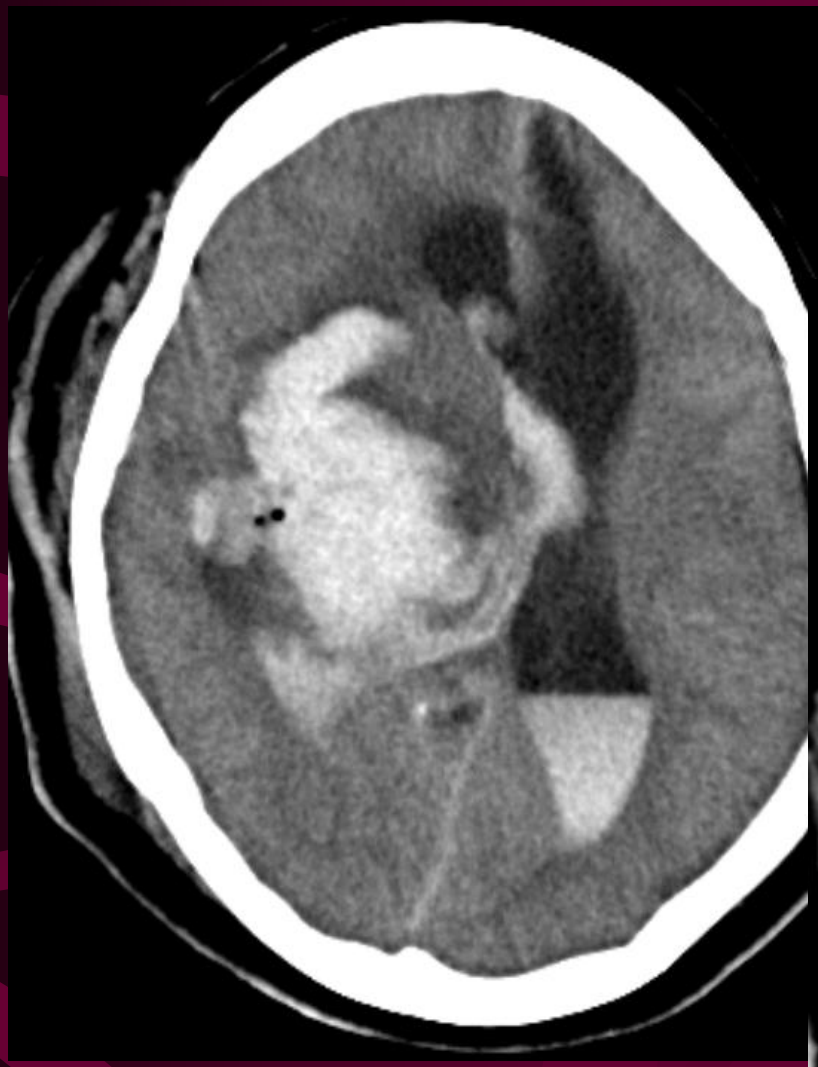
常见于丘脑、基底节区

出血较多时有占位效应

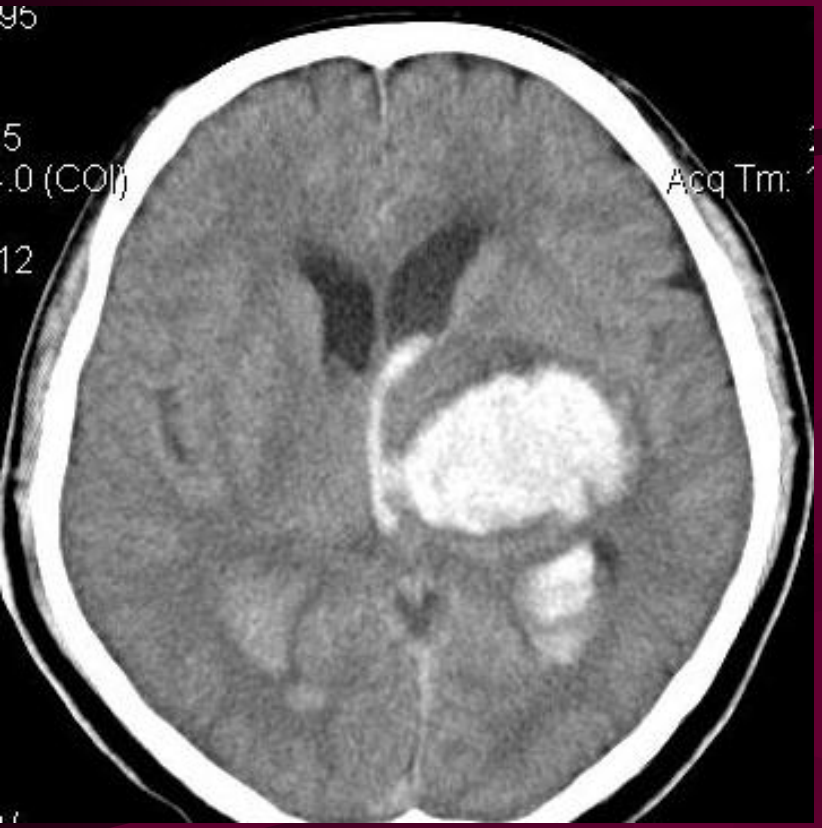
可破入脑室和蛛网膜下腔

脑出血－CT表现

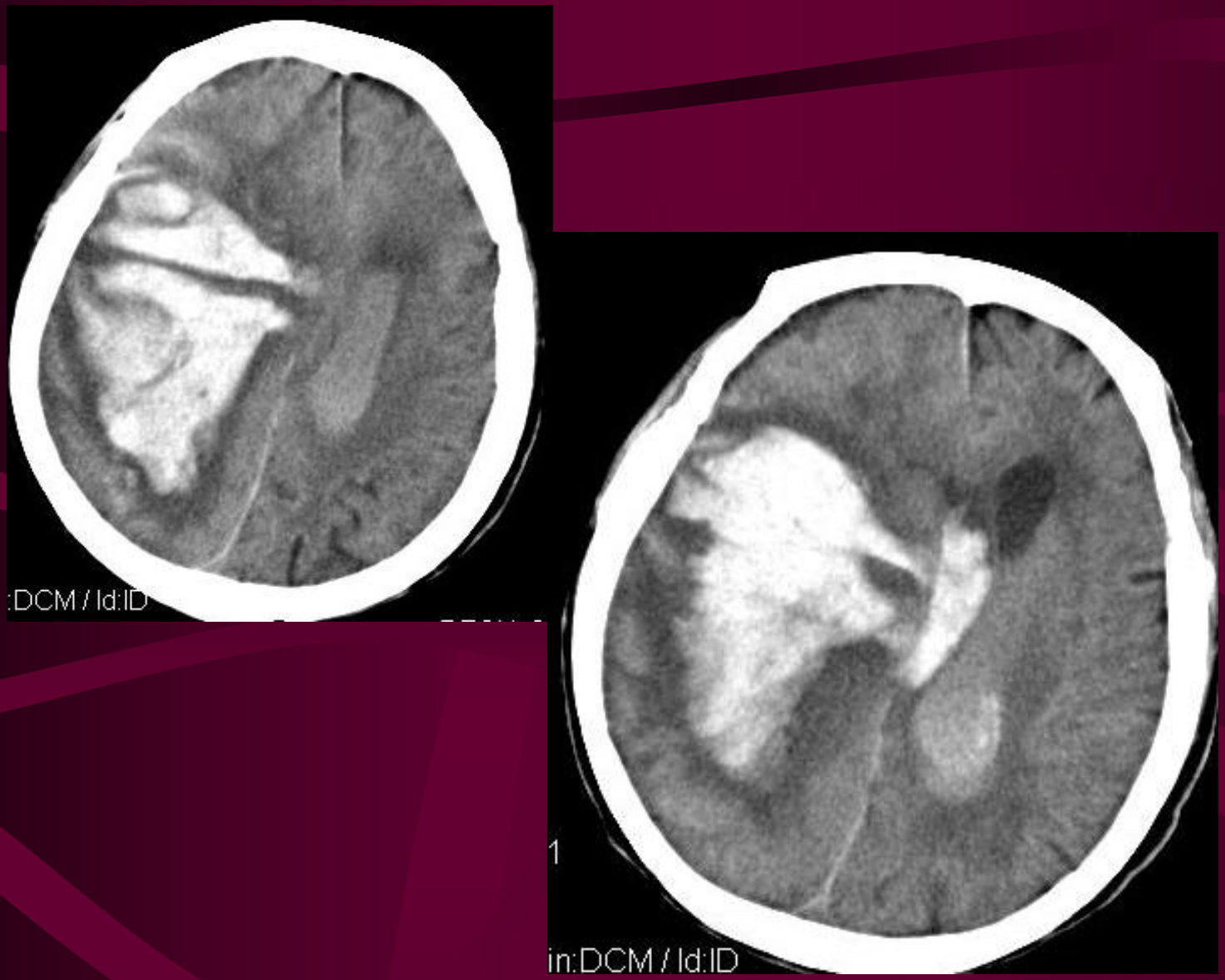




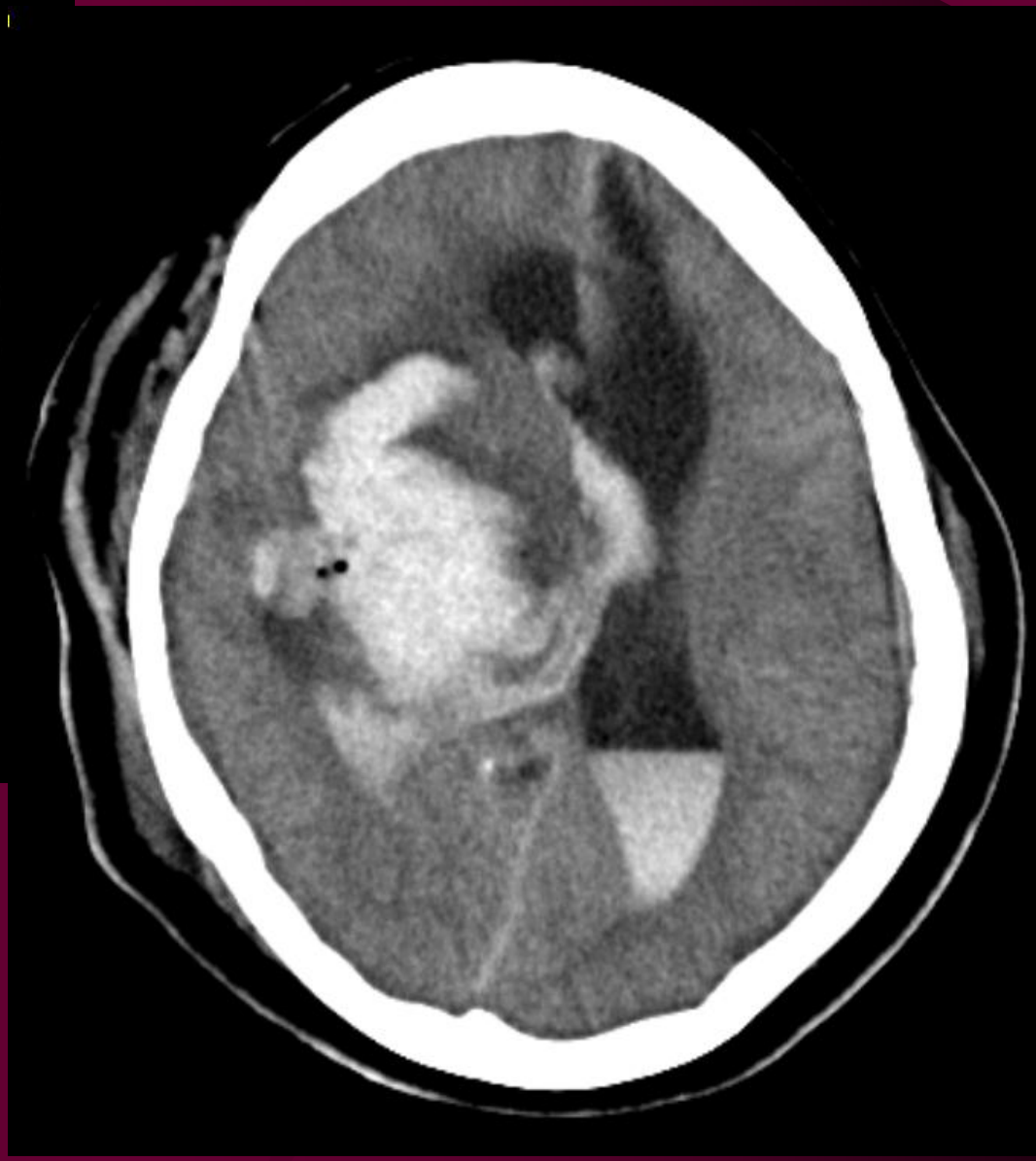
男63岁。突发意识丧失1小时入院，有高血压史。

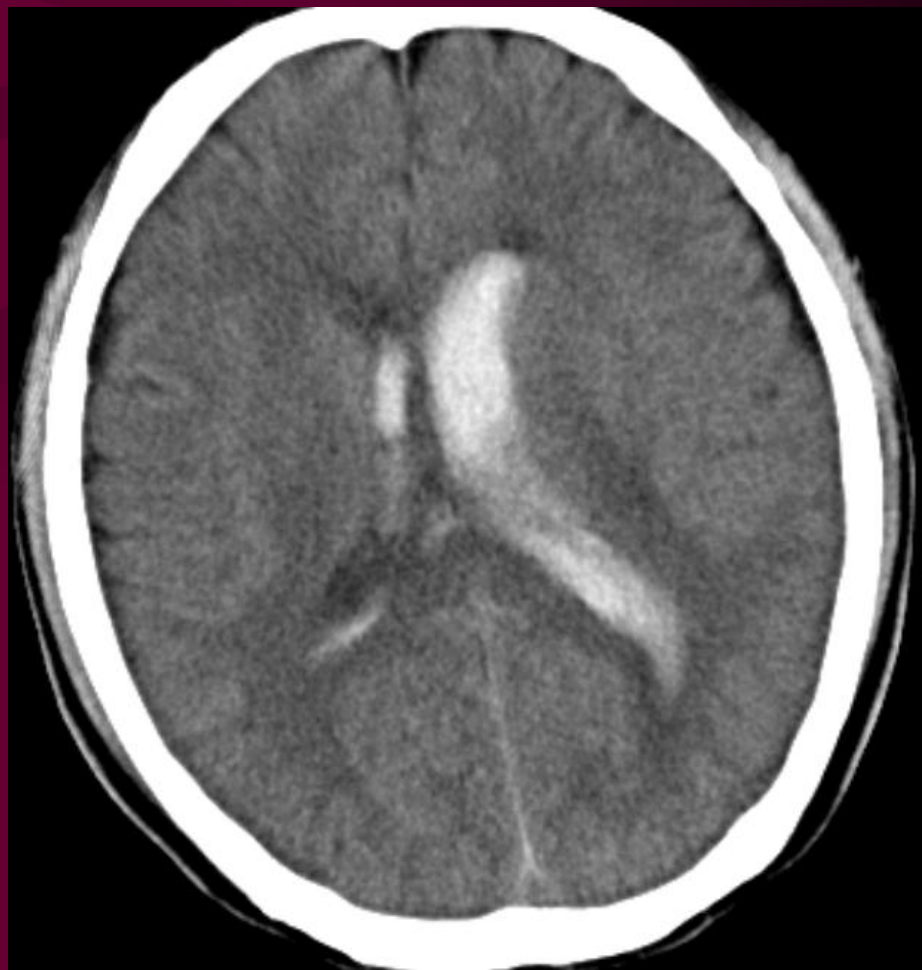


男71岁。右侧肢体偏瘫5小时，有高血压史10余年。左侧丘脑区脑溢血并破入脑室内。



女，69岁,突发意识丧失42小时。右侧基底节区脑溢血并破入脑室系统





破入脑室

脑出血—CT表现

2、CT可随访脑出血的动态变化

24小时内，高密度

数天内，边缘不清

3～4周，等密度

2～3月，等—低密度

可持续3～6月

脑出血—CT表现

血肿周围的水肿：

开始：薄层水肿带

2周内：水肿带增厚

2～3周：水肿达高峰

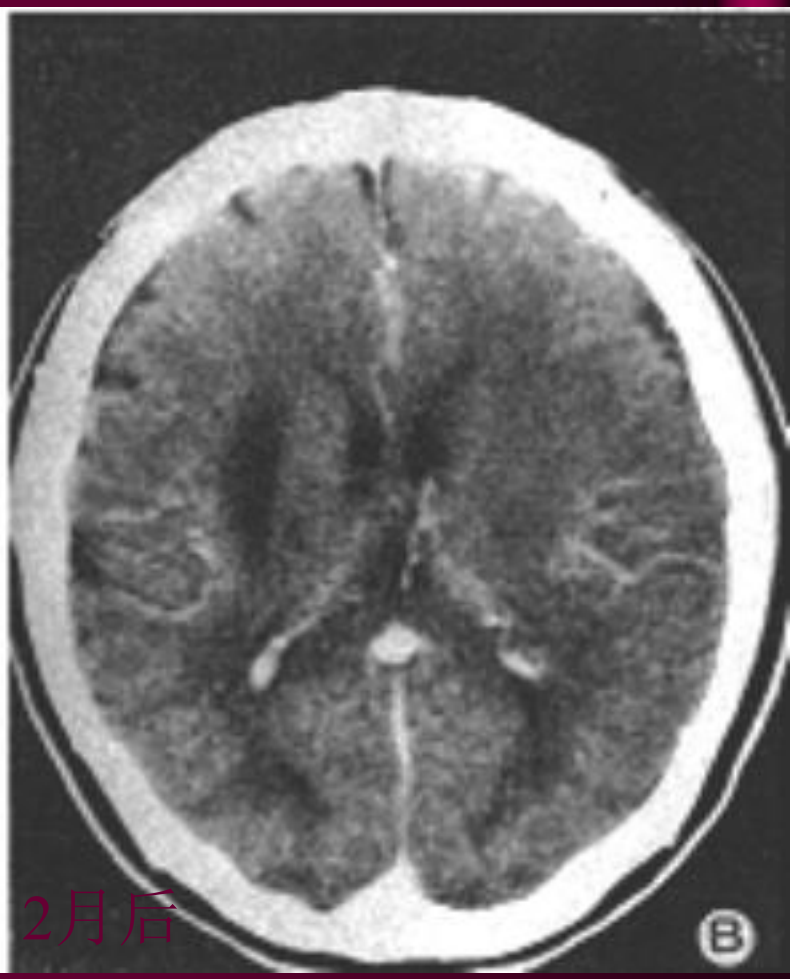
3周后：开始消退

1个月：基本消失

脑出血－CT表现

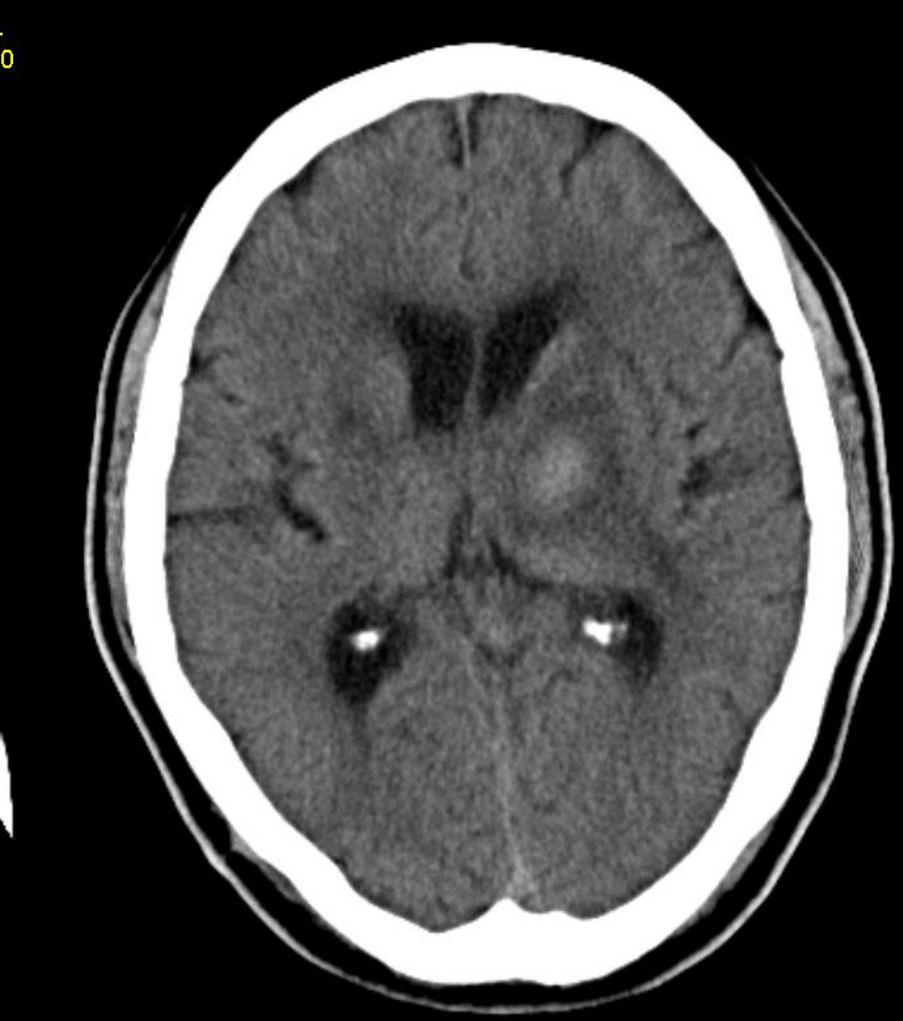
脑出血—CT表现

血肿动态变化



女，67岁。左侧突发偏瘫3小时入院，治疗12天。
右侧外囊区脑溢血CT表现。

男，87岁。脑溢血治疗1月余CT复查。部分病变吸收。



脑溢血伴腔梗

出血吸收期

脑出血－CT表现

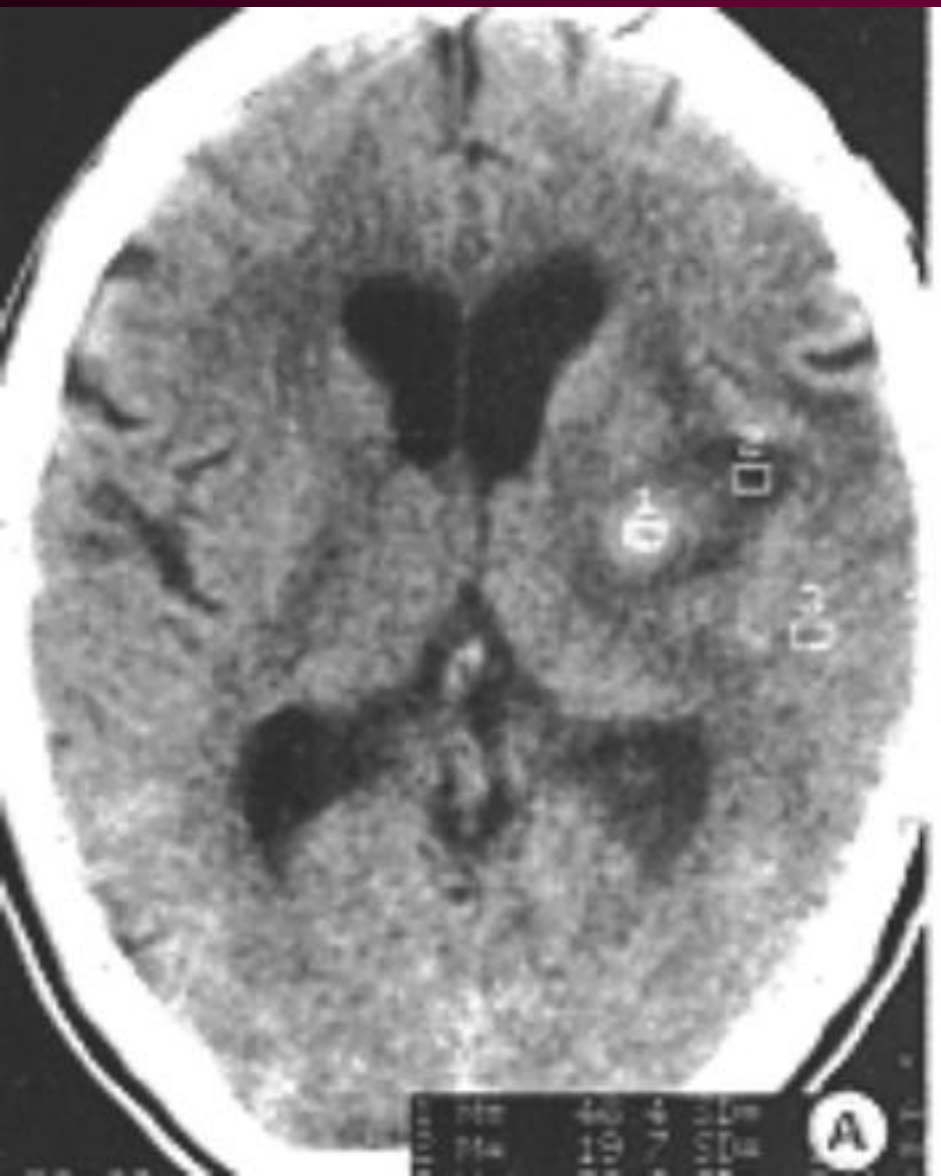
3、增强。多数不需增强。鉴别诊断时可用。表现为环状增强，梗塞后3～5周时出现率最高。

原因：早期可能是血脑屏障破坏

晚期可能是毛细血管增生

肉芽组织形成

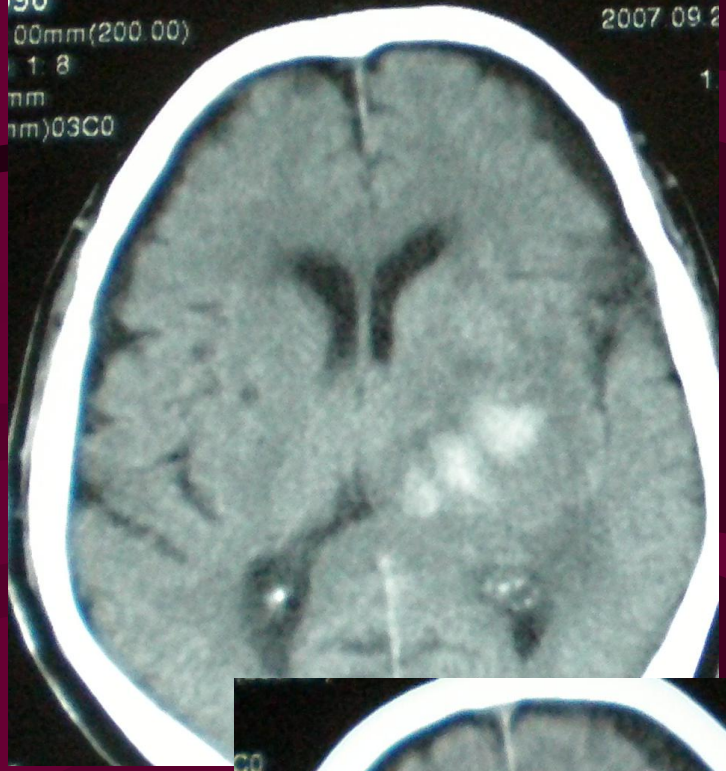
脑出血—CT表现



脑溢血20天

出血吸收期增强表现

9月17日



9月28日

10月30日

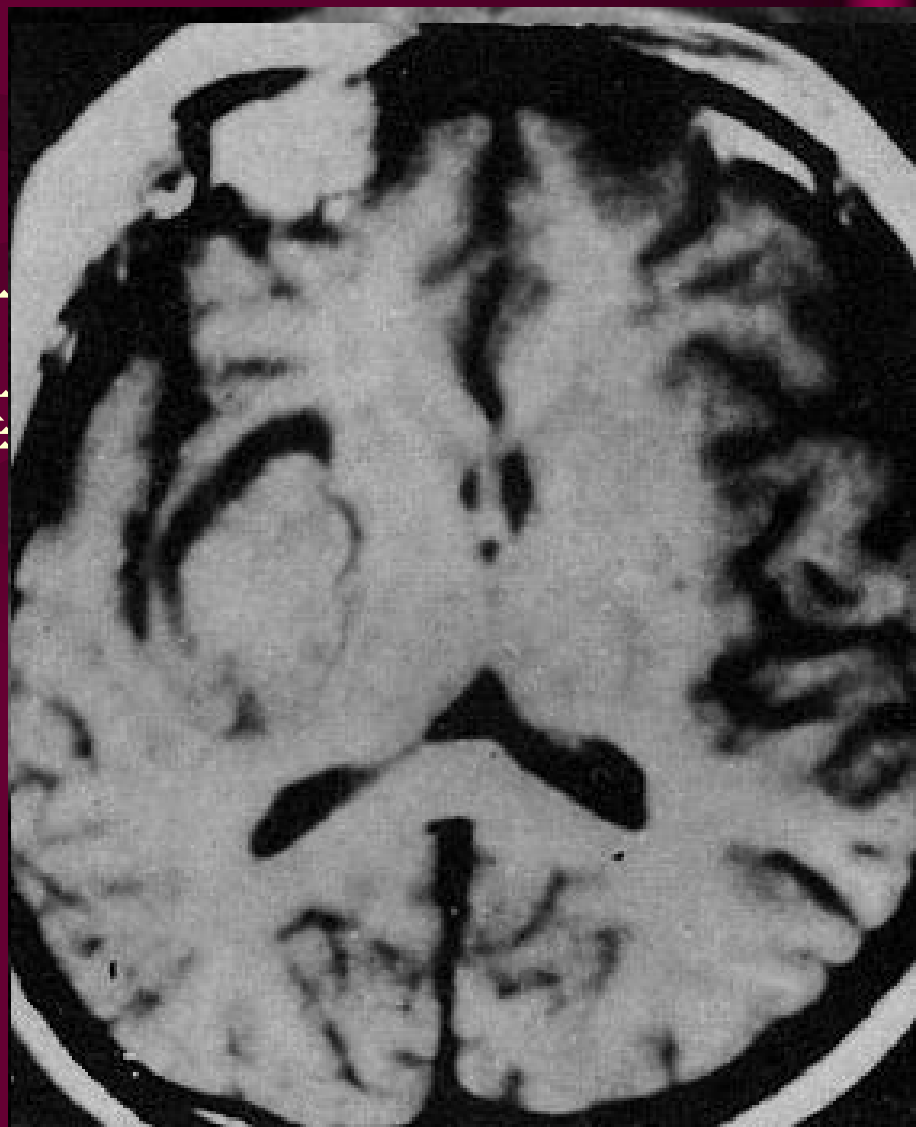
脑出血—MRI表现

血肿的演变：

血凝块，红细胞内氧合血红蛋白—去氧血红蛋白—高铁血红蛋白—游离的高铁血红蛋白—血红素—含铁血黄素

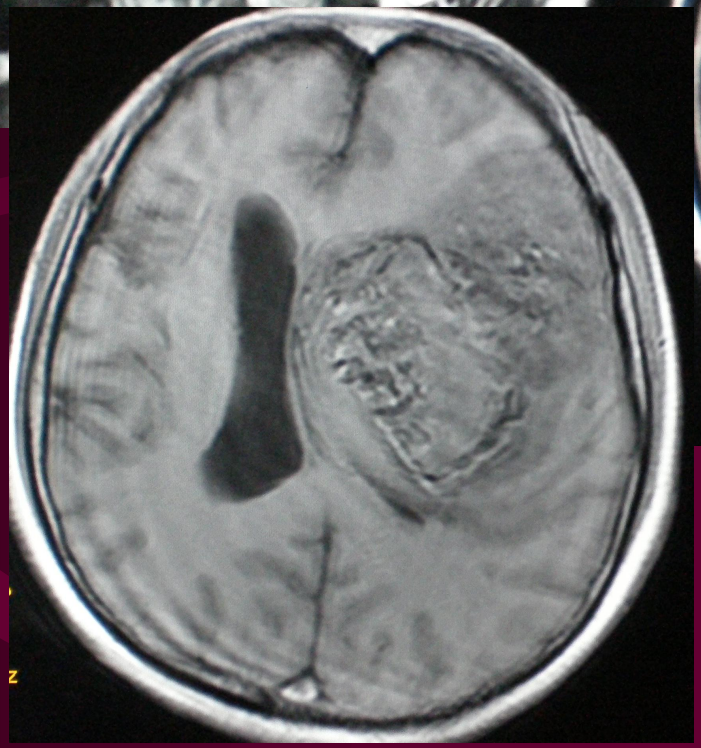
脑出血—MRI表现

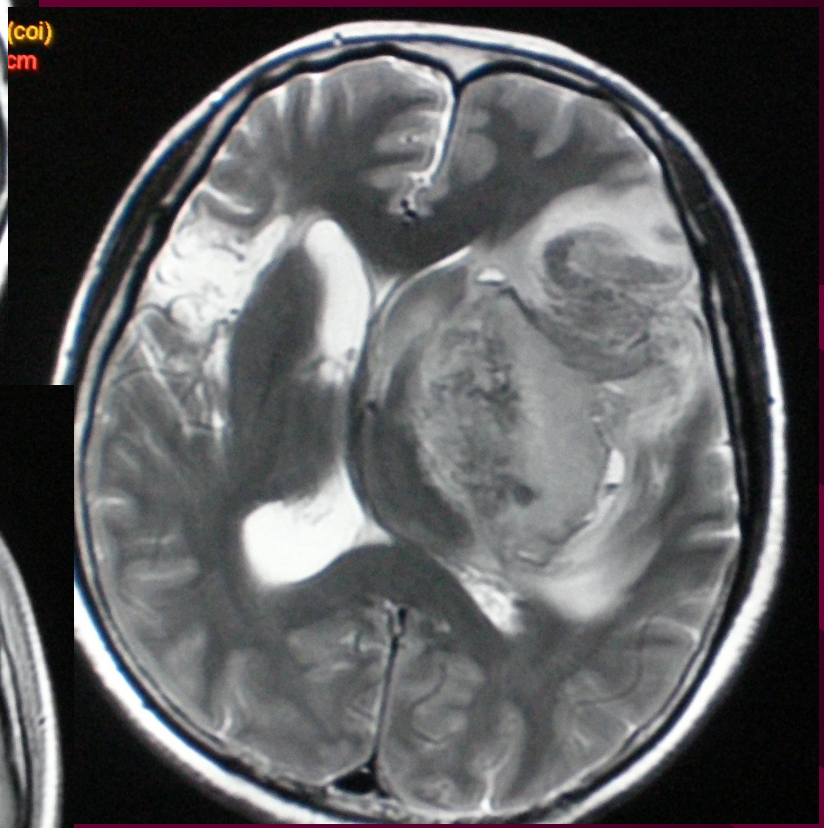
1、急性早期（24H内）T1WI约低信号或等信号；T2WI等或约高信号。

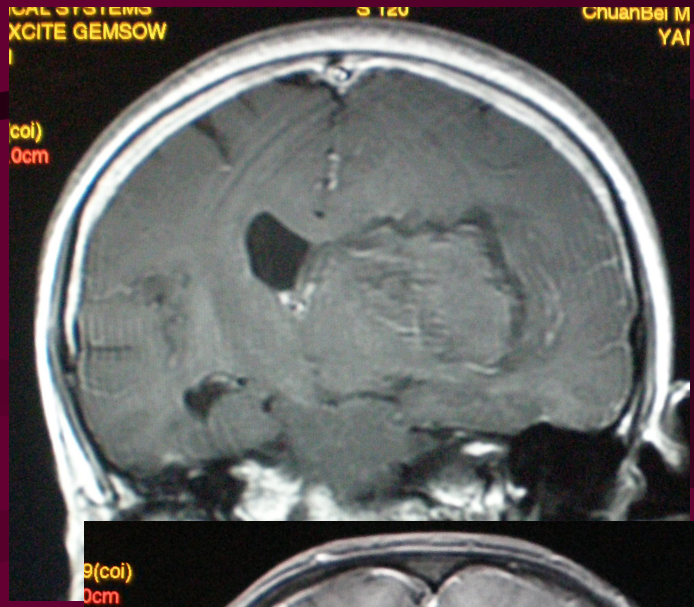


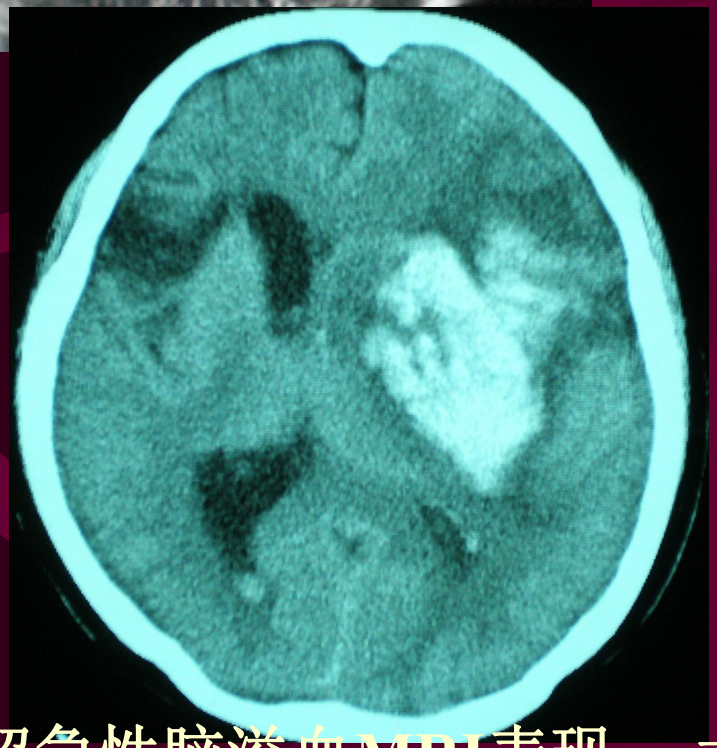
脑出血—MRI表现

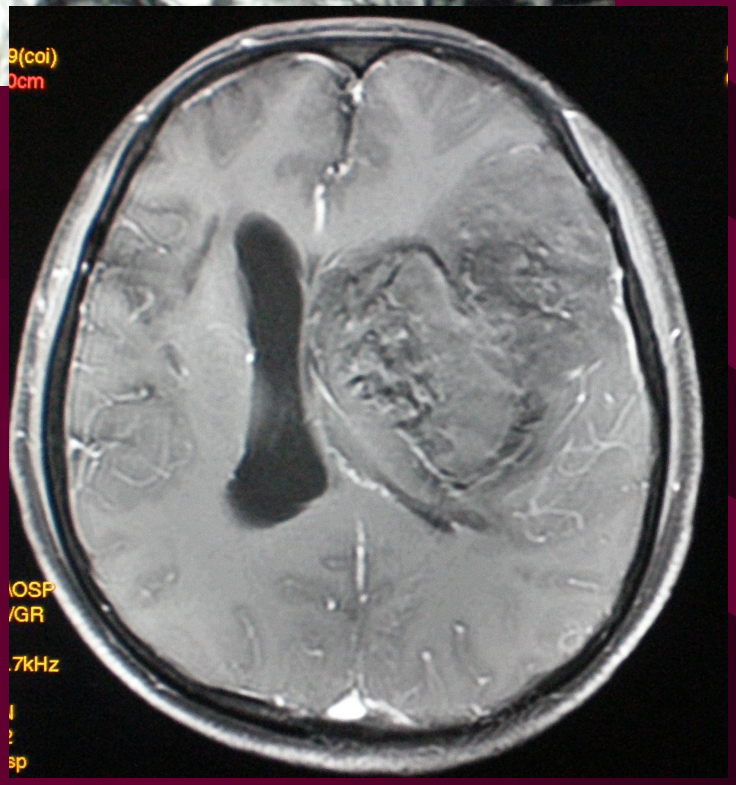
2、急性期1—3天T1WI等信号，T2加权核心层和核外层外低信号，周围水肿为高信号











超急性脑溢血MRI表现： 女，54岁，突发昏迷1小时入院。

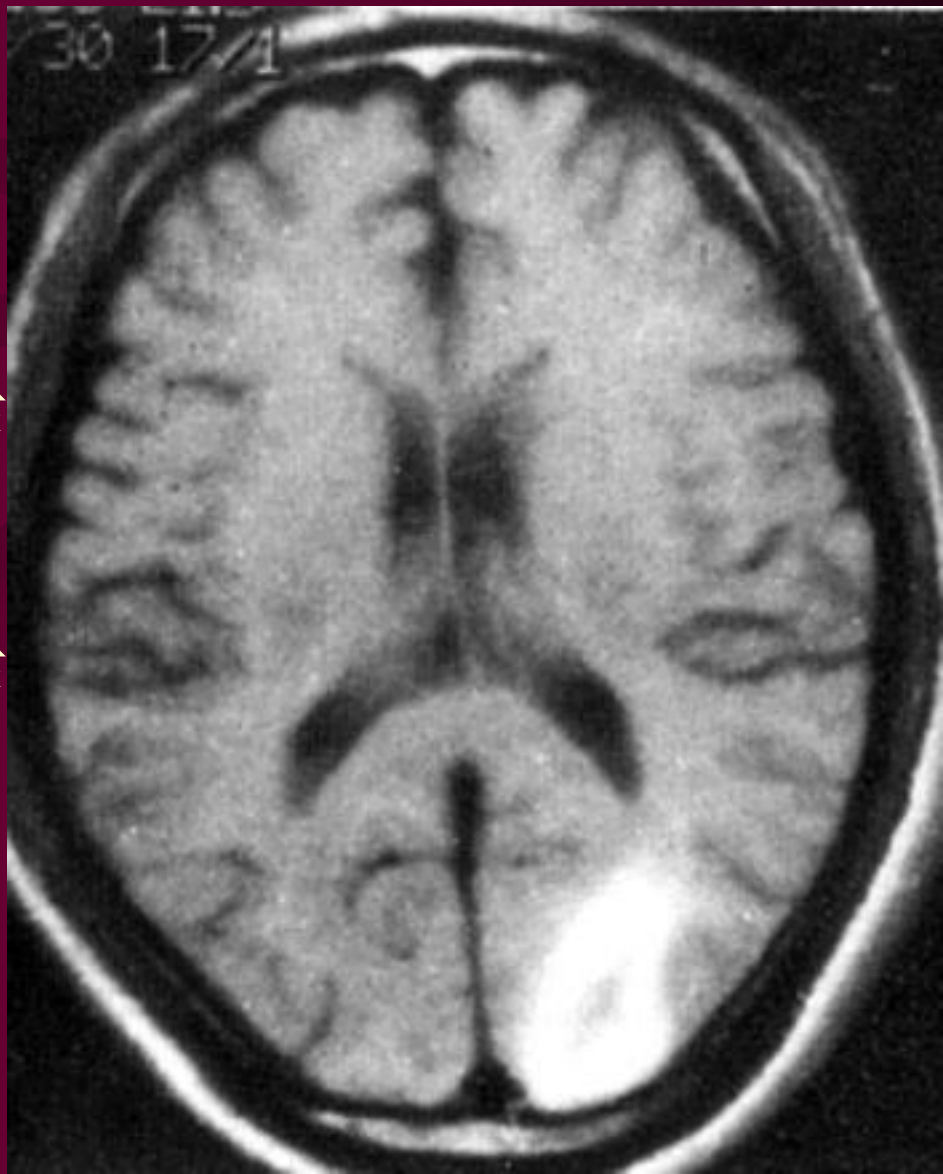
脑出血—MRI表现

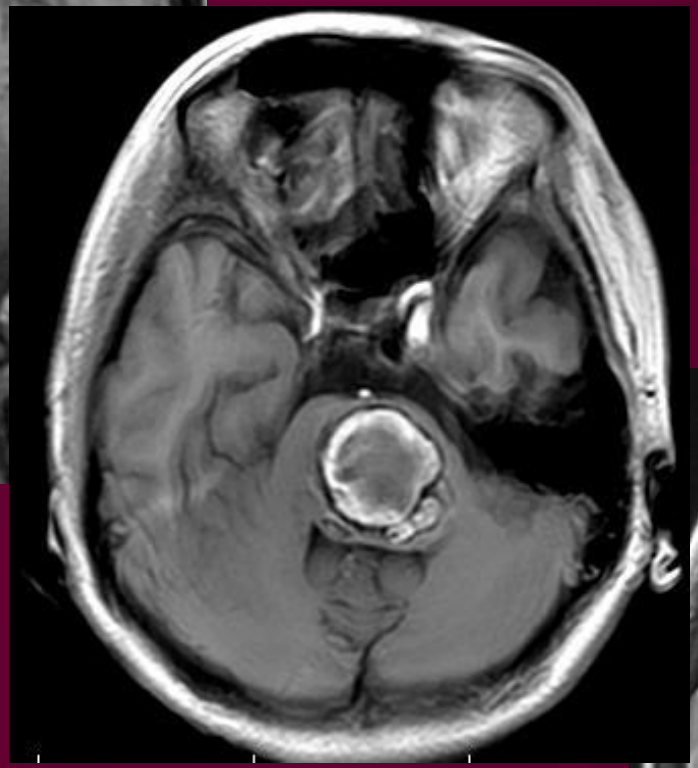
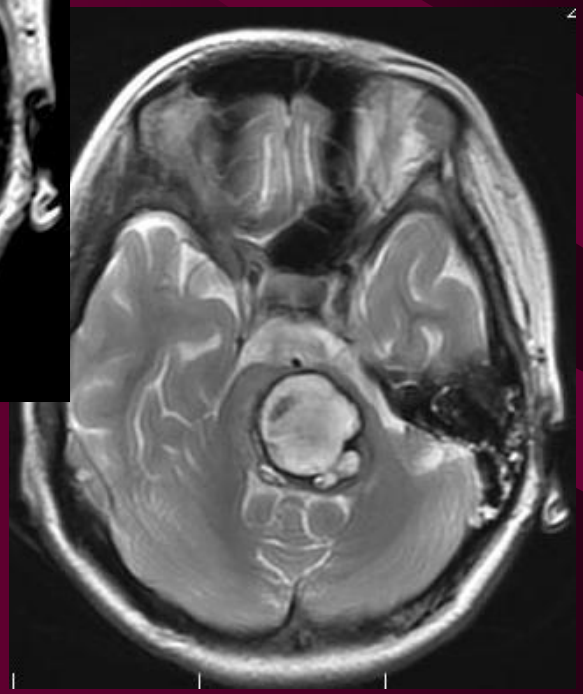
3、亚急性期3天～2周：

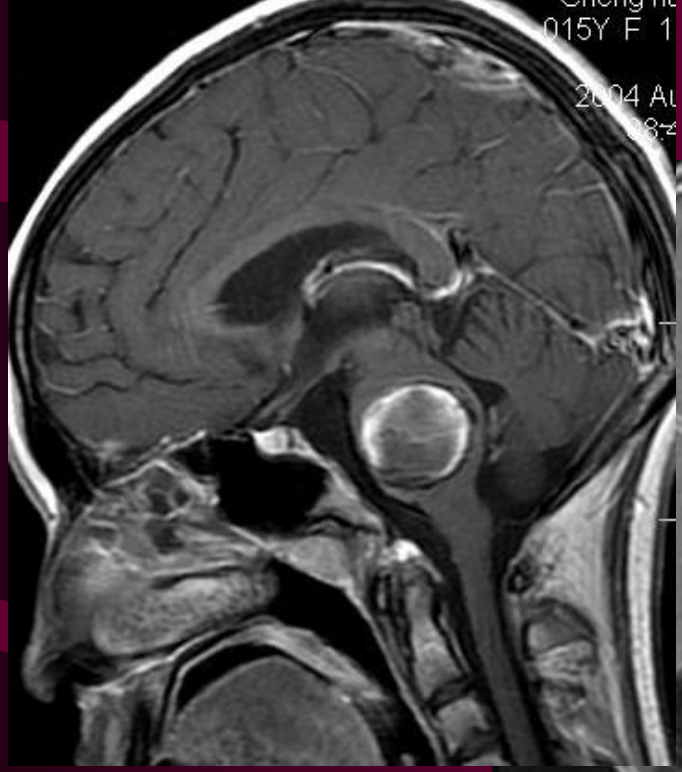
核心层：T1WI等信号，T2WI低信号

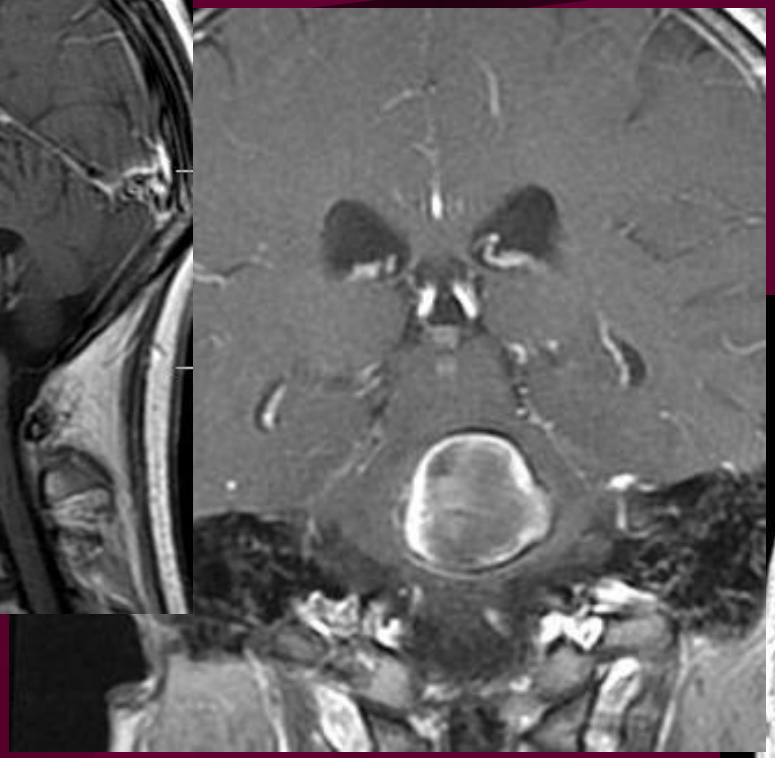
核外层：T1WI高信号，T2WI低信号

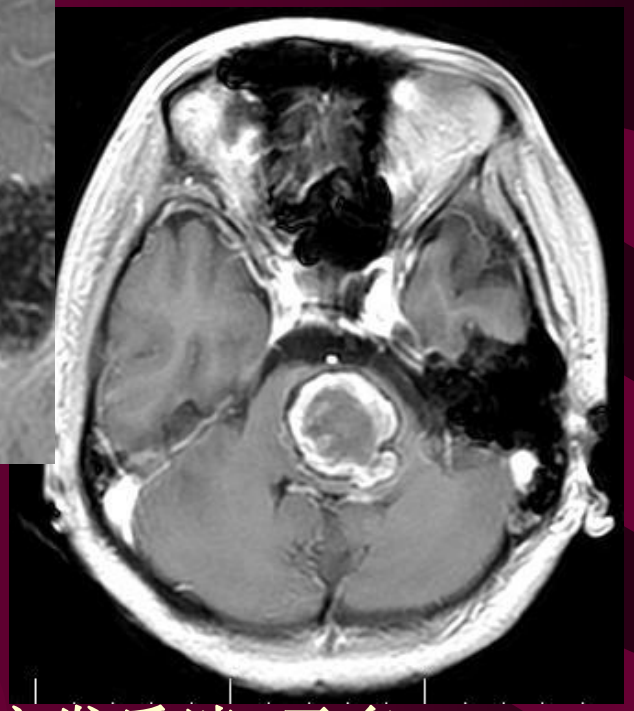
周围水肿带信号。





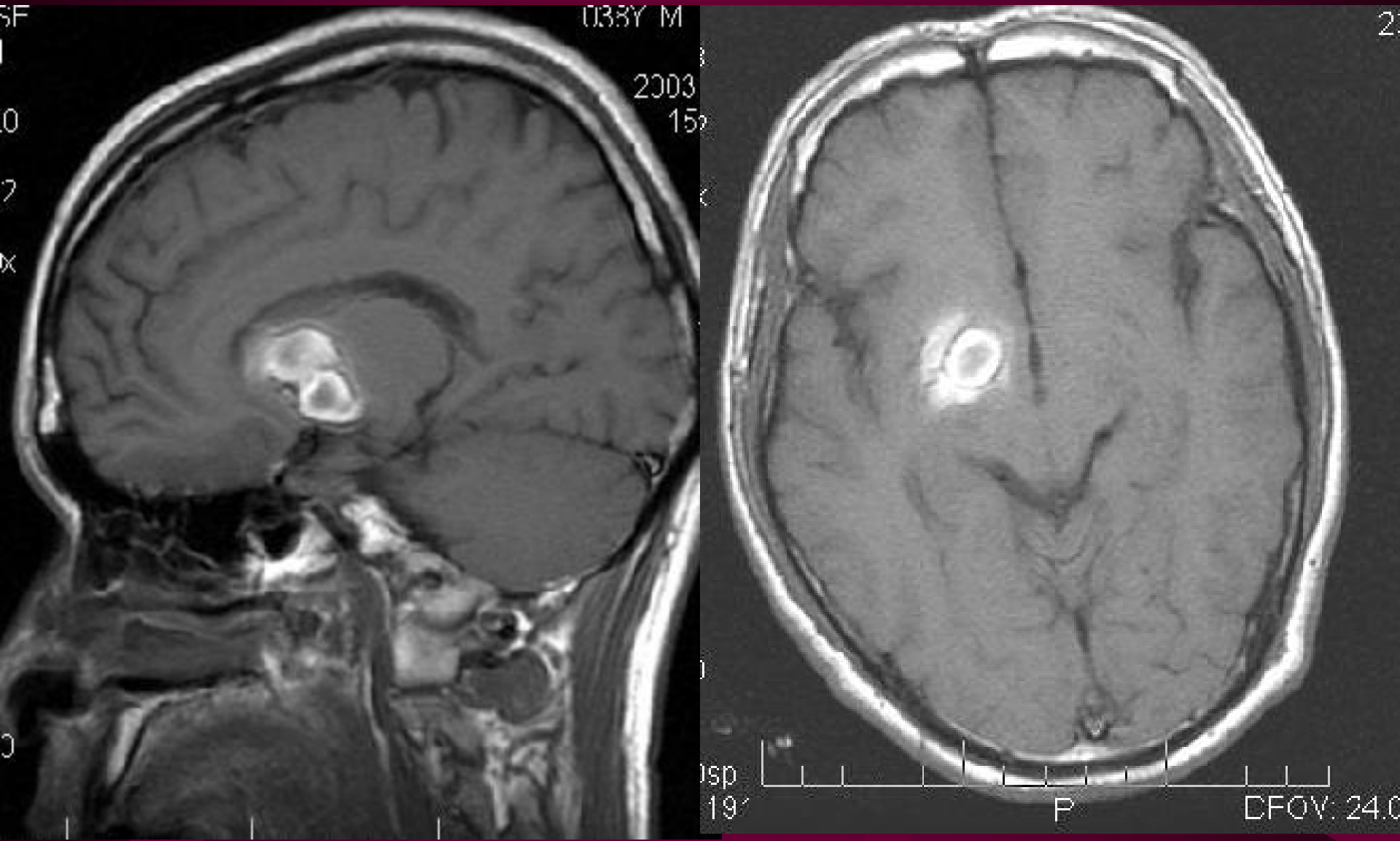




亚急性期脑溢血MRI表现：女15岁，突发昏迷5天多。
病灶周围呈高信号，中央呈稍低信号改变。增强无强化。

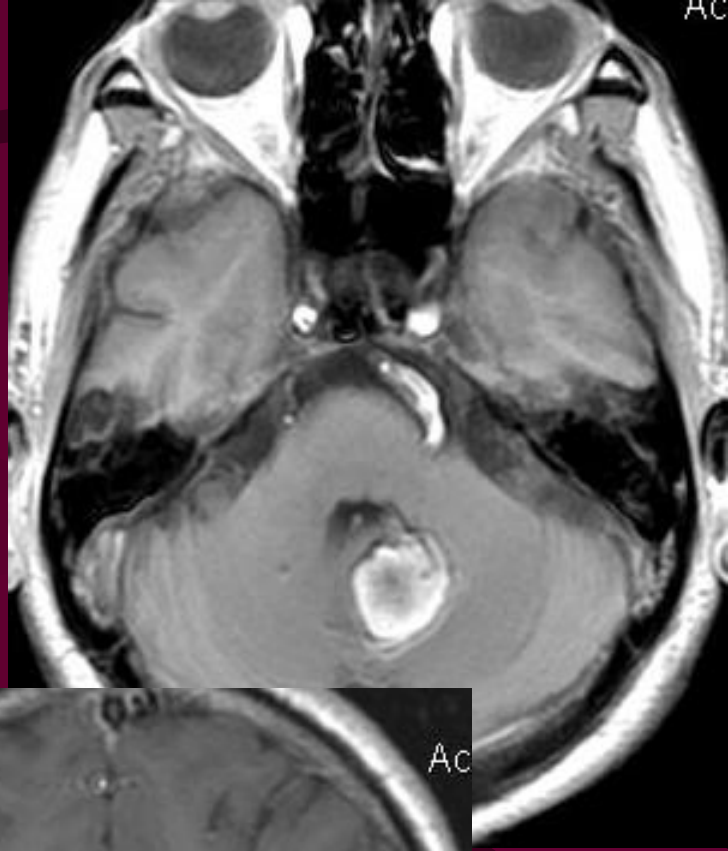
脑出血—MRI表现

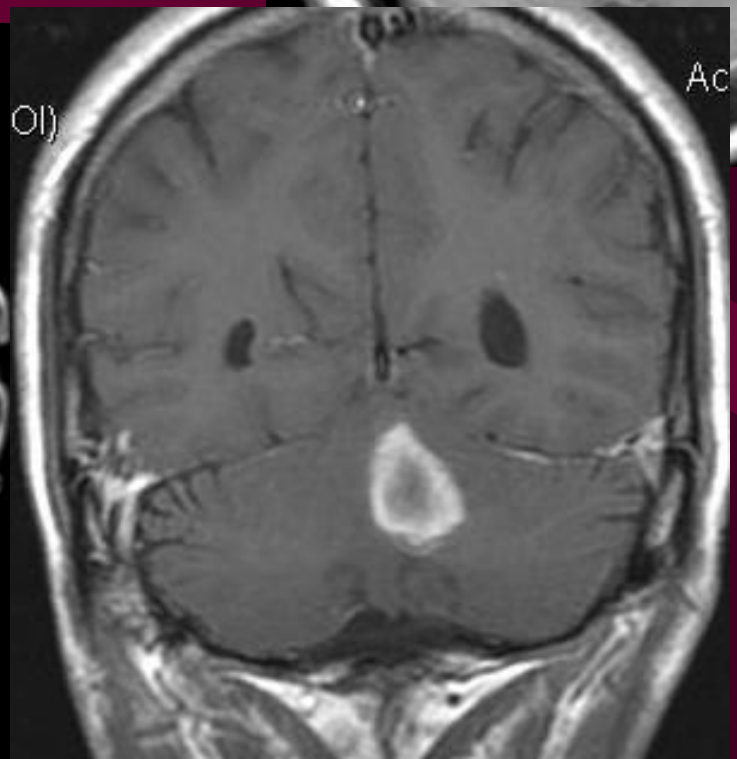
4、慢性早期10天～3周：
T1WI、T2WI均为高信号，周围水肿常消失，可有含铁血黄素沉着

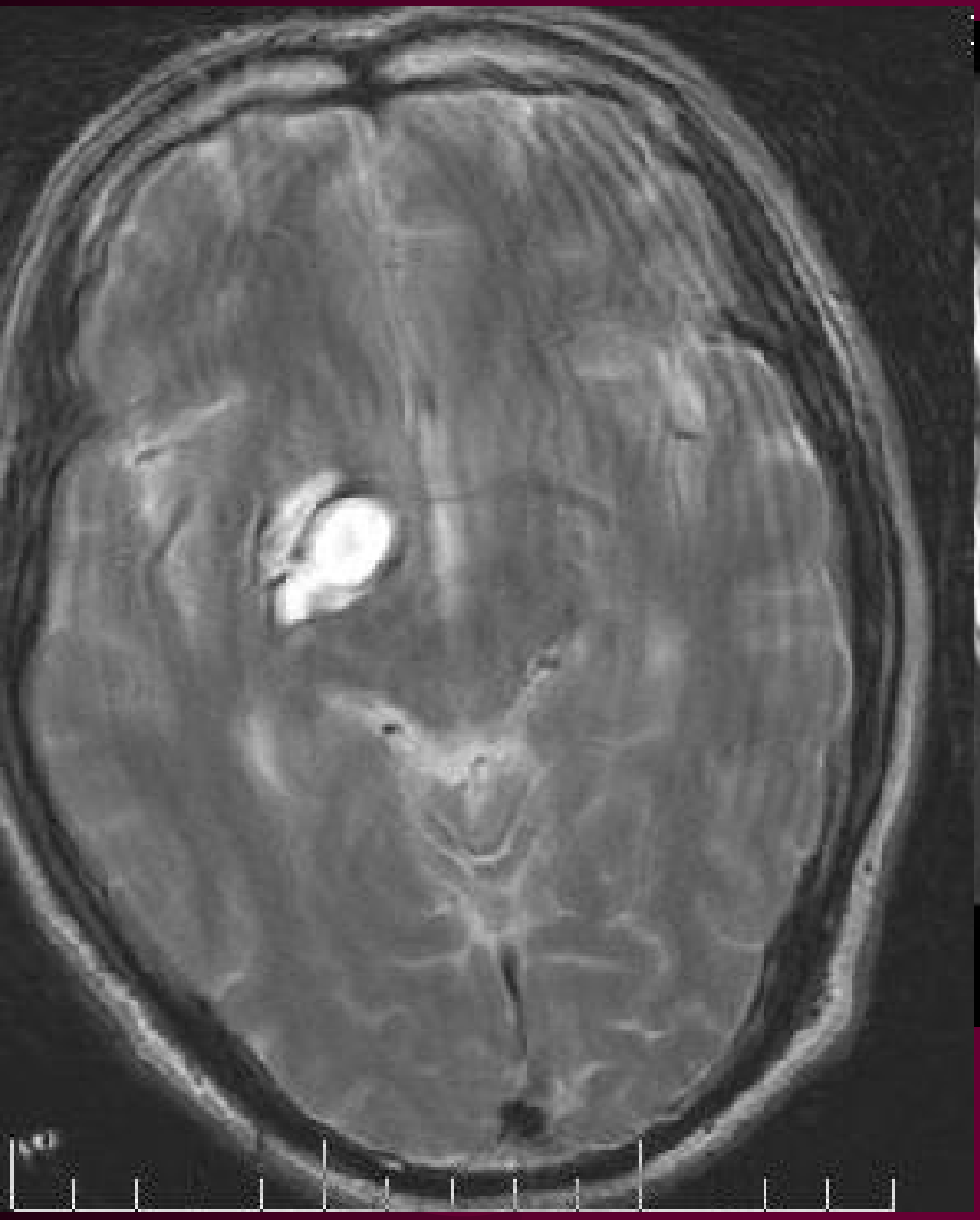


脑溢血

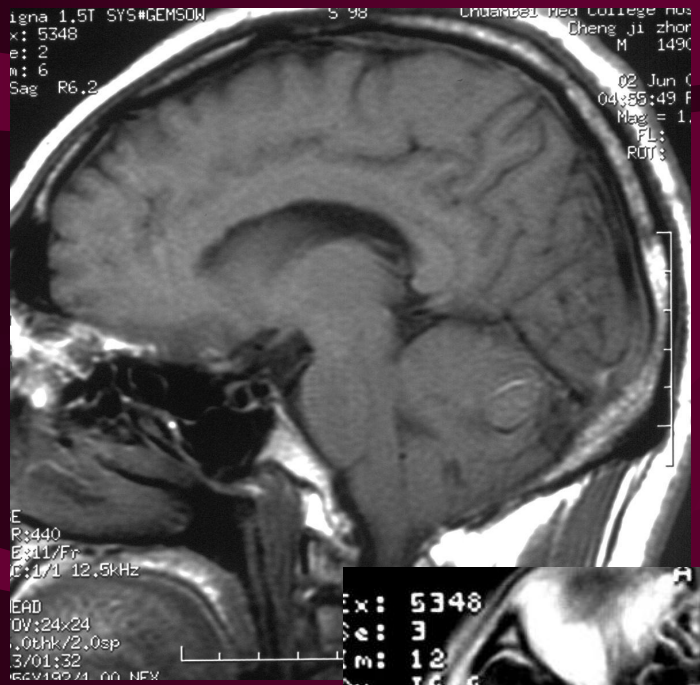
出血

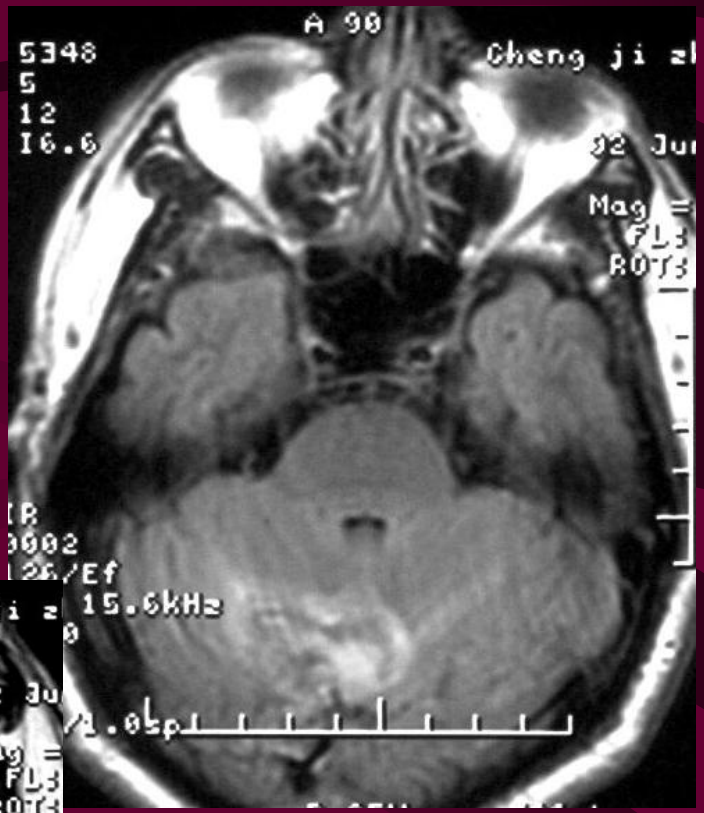




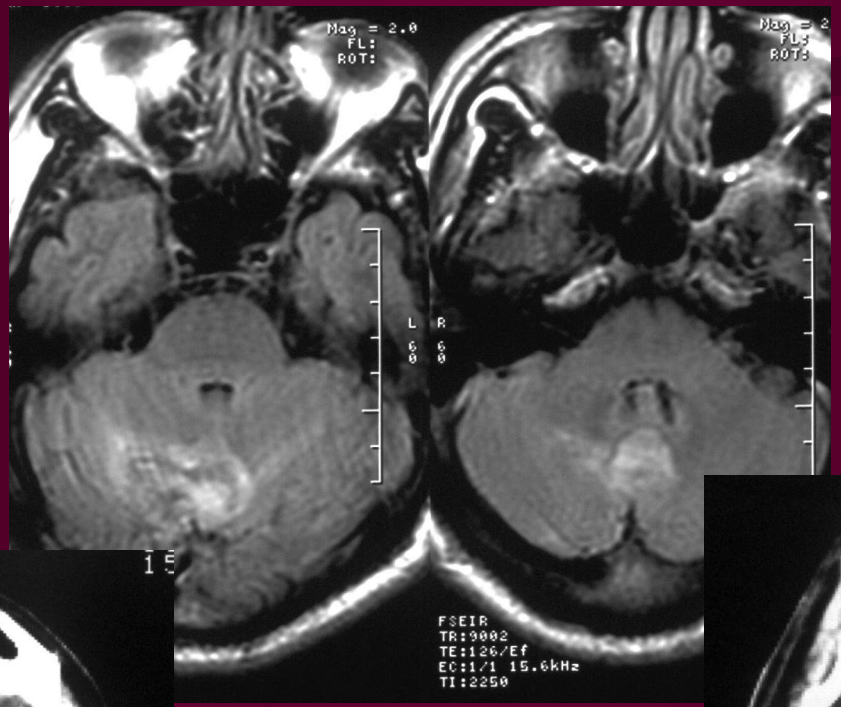


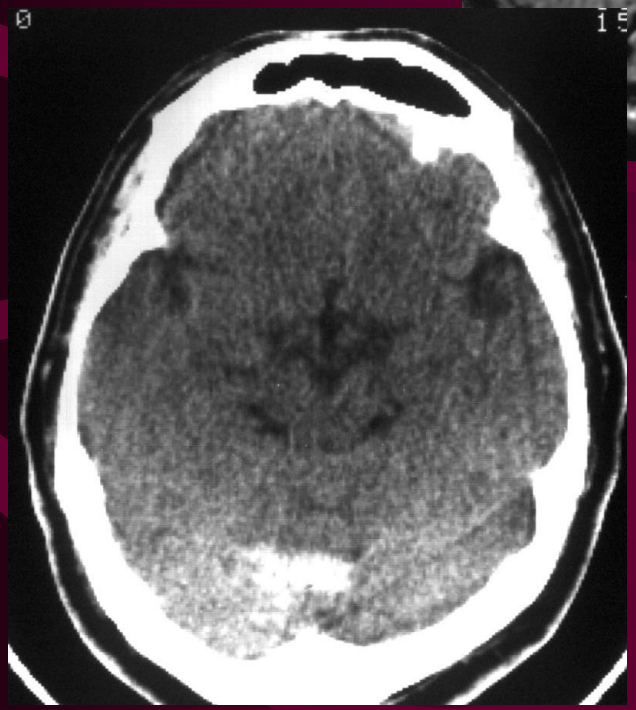
脑溢血


igna 1.5T SYS#GEMSOW
x: 5348
e: 2
m: 6
Sag R6.2
E
P:440
E:11/Fr
G:1/1 12.5kHz
EAD
OV:24x24
.0thk/2.0sp
3/01:32


A 90
5348
5
12
I6.6
Cheng ji z
02 Ju
Mag
FL3
ROT3
15.6kHz


Cheng ji z
02 Ju
Mag
FL3
ROT3
ET:12
fse-x1/90
TR:3400
TE:98.6/Ef
EC:1/1 17.9kHz





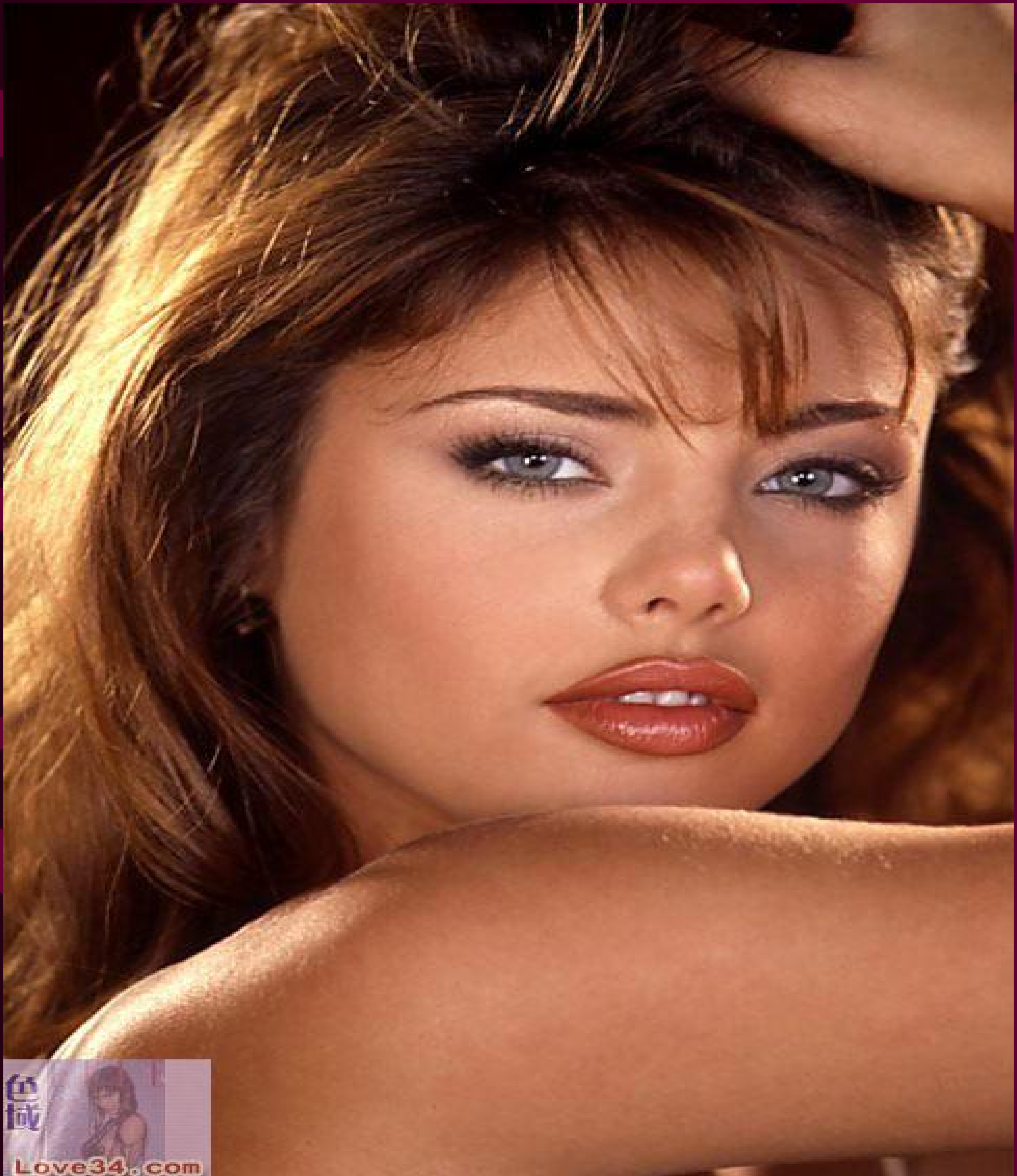
男，48岁，行走不稳2天多，小脑半球脑溢血MRI及CT表现

脑出血—MRI表现

5、慢性期3周以上T1WI、T2WI血肿为高信号，周围有明显的含铁血黄素沉着。

T1WI、T2WI均为低信号。

T1低、T2高信号。



谢谢！